

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 355. (No. 42, Vol. VII.)

OCTOBER 15, 1915.

[Registered at the G.P.O.] [Weekly, Price 3d. Post Free, 3½d.]

Flight.

Editorial Office: 44, ST. MARTIN'S LANE, LONDON, W.C.
Telegrams: Truditor, Westrand, London. Telephone: Gerrard 1828.

Annual Subscription Rates, Post Free.

United Kingdom ... 15s. od. Abroad ... 20s. od.

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EDITORIAL COMMENT.

Air Supremacy and Casualties.

In the official report emanating from the German Main Headquarters, on the 6th inst. an ingenious attempt at claiming supremacy in the air for the German services without actually saying so, is made. The German communication was as follows :—

"In the English report of October 1st, it was stated that the English had gained the upper hand over our aviators in aerial battles. With regard to this, the following *résumé* gives the best information :—

"In the month of September the losses in German aeroplanes amounted in aerial battles to three, two are missing, and owing to bombardment from the earth two were also lost; in all seven aeroplanes. In the same period in aerial encounters the English lost eight aeroplanes, and the French twenty-two—a total of thirty aeroplanes."

By itself, and uncontradicted, this statement is highly plausible, but from certain knowledge which we have, and the added refutation by the French Staff of the German Staff's claim, we are left very unconvinced of the truth of the figures as set out in the German *communiqué*. The denial issued by the French Staff is unequivocal in its terms, as witness the following :—

"These totals are open to dispute. The figure which concerns us exceeds by more than one-third our true losses. As to the

German aeroplanes, during the course of last month we have seen more than seven fall, some in their own lines and some in ours, in an obviously helpless condition; but even that is only one side of the question.

"A comparison of the losses suffered does not permit of any serious conclusion if it is not accompanied or corrected by a comparison with the amount of work accomplished and with the results attained. Our scouting squadrons are active and daring, our chaser aeroplanes are always ready and thirsting for battle. The German aviators, on the contrary, manifest on every occasion a discretion which is imposed upon them by strict injunctions.

"One can judge of this fact by the following order emanating from the Headquarters of the 8th Reserve Corps. No. 19,635, of August 28th.

"These battle aeroplanes should only take the air to fight the aeroplanes which have crossed the French lines. They are ordered not to cross the lines themselves under any pretext."

"The terms of this order tend to show, perhaps: (1) That the German aviators have in the past suffered substantial losses; (2) that the High Command does not care to expose them to losses still more substantial; but it is difficult to find here a proof that the mastery of the air belongs to the Germans."

In reply to this the cudgels were taken up by the German military journal the *Kreuz Zeitung*, which says :—

"The belief of the French in the great superiority of their aeroplanes was a pretty error, with which they deceived themselves until the war brought the great test. In East and West our aeroplanes have shown that they meet all the requirements of war, and our airmen, who before the war were, according to the French, not worth considering, have done so brilliantly that a great part of them have already been decorated with the Iron Cross of the First Class. The war has proved the true value of our aeroplanes, as Paris itself knows. The reason that, in peace time, people believed in the superiority of French air-work was that the French boasted about every success, while we did honest and successful work without looking for applause. The splendid achievements of our airmen when war broke out produced almost as great surprise in France as did our 17 in. howitzers."

In generalising as the *Kreuz Zeitung* does, the idea is to dodge the facts, but whatever the real figures may be of the particular period to which the above extracts refer, the outstanding fact remains that the losses in the *personnel* of the German Flying Corps have been very serious, and particularly so when taken in conjunction with the amount of work accomplished. If corroboration were needed of the Allies' position in air work, the many official utterances of Sir John French in every way carry with them a conviction of the superior daring of our flying officers, a superiority which we can in no way see is attributable to or affected by the instructions for caution, promulgated by German headquarters order. The battle-planes to which the particular order specially refers are of but recent growth, and there is no reason to suppose that these are likely to turn the tables upon the Allies' initiative, any more than the other flights of aero-

planes in use generally have been able to do in the past. Now for a few facts :

Taking into account the comparative scarcity of German aeroplanes, and the failure of those few, as we claim, that do venture forth to put up a fight, the casualty list might reasonably be expected not to be a very formidable one. From the official lists published in Germany, however (which do not take into account the casualties in the Austrian flying services), it would appear that one way and another the German air services have not been exempt from paying a heavy toll, in spite of any economy that may have been exercised in the utilisation of the *personnel* and *matériel* available.

After an elimination of casualties that have appeared twice in the lists, as for instance when an aviator has first been mentioned as missing, and is later officially reported killed or prisoner, the losses in the field divisions up to the end of August are :—

Killed or died from illness or wounds, 187.

Wounded or injured, 130.

Prisoners or interned, 58.

Missing, 63.

Giving a total of 438.

In the Bavarian Flying Corps the casualties have been 1 killed, 1 missing, and 6 wounded, while the number of casualties in the Reserve are 10, of which 9 have been killed and 1 wounded.

This brings the grand total up to 456 for the German air services.

If to this be added the number of casualties that must have taken place in the Austrian flying services, of which no official lists are available, it will be seen that the losses of the Central Powers are by no means small.

That the heavy losses inflicted upon the enemies' air services and the Allies' bid for the mastery of the air on the western front have not been gained easily and without sacrifice is obvious, and it cannot be expected that our own losses should under the circumstances be insignificant. Yet everything considered, the price paid cannot be said to be too high.

But that is a very different thing to waiving our claim to supremacy. Quite the contrary. It is by that very sacrifice that our position has been attained, and we have not a shadow of doubt but that our Flying Services will never allow their laurels to be snatched from them, battleplanes or no battleplanes. But in this connection again there is little to carp at. Already the French are forward with their big fighting planes, as announced this week, and there need be no despairing screeches as to where the British big craft are. Let them alone and they'll come along, and perhaps a bit more speedily than some are inclined to credit. It is to be hoped though that in view of the fact that officially they are practically non-existent, the newly-formed "A.I.G.B." will not presently lay claim to *all* the credit in this direction. There are things which are better left in shadow behind at times like these, especially when we *have* to leave them there—by order!

The French Air Developments.

For some considerable time the air has been full of rumours regarding the latest developments of the fifth arm, both by our enemies and ourselves, and numerous statements have appeared, some of which may have been facts, but many of which have obviously been fancies. Thus, for instance, the majority of claims regarding new battleplanes of the enemy should be read with reserve, as reliable information concerning them is necessarily re-

stricted, especially as regards publication. In a similar manner, the "information" reaching us from American papers of the new superplanes that are supposed to be nearing completion, when they will be shipped to the various air services of the Allies, is of such a nature as to tax, in many respects, the credulity of even non-technically minded people. That developments are indeed constantly and rapidly going on is, of course, not to be concealed, and it is only when it comes to reports that cannot have been founded on facts, and which moreover sound technically improbable, that we should like to warn our readers against placing too great confidence in such statements.

While up to the present little or no official information has been allowed to see daylight regarding the steps taken by our own authorities to ensure an ascendancy in *matériel* similar to that already established by our *personnel*, it appears that our French Allies have reached a stage of perfection in the development of their new types of aircraft which warrants the granting of an inspection of the latest fleet of armoured aeroplanes. In this connection the communication sent to the *Times* from Paris by a correspondent is highly interesting, especially the description of the new giant triplane, which is the French reply—as referred to in our preceding article—to Germany's much boasted battleplanes.

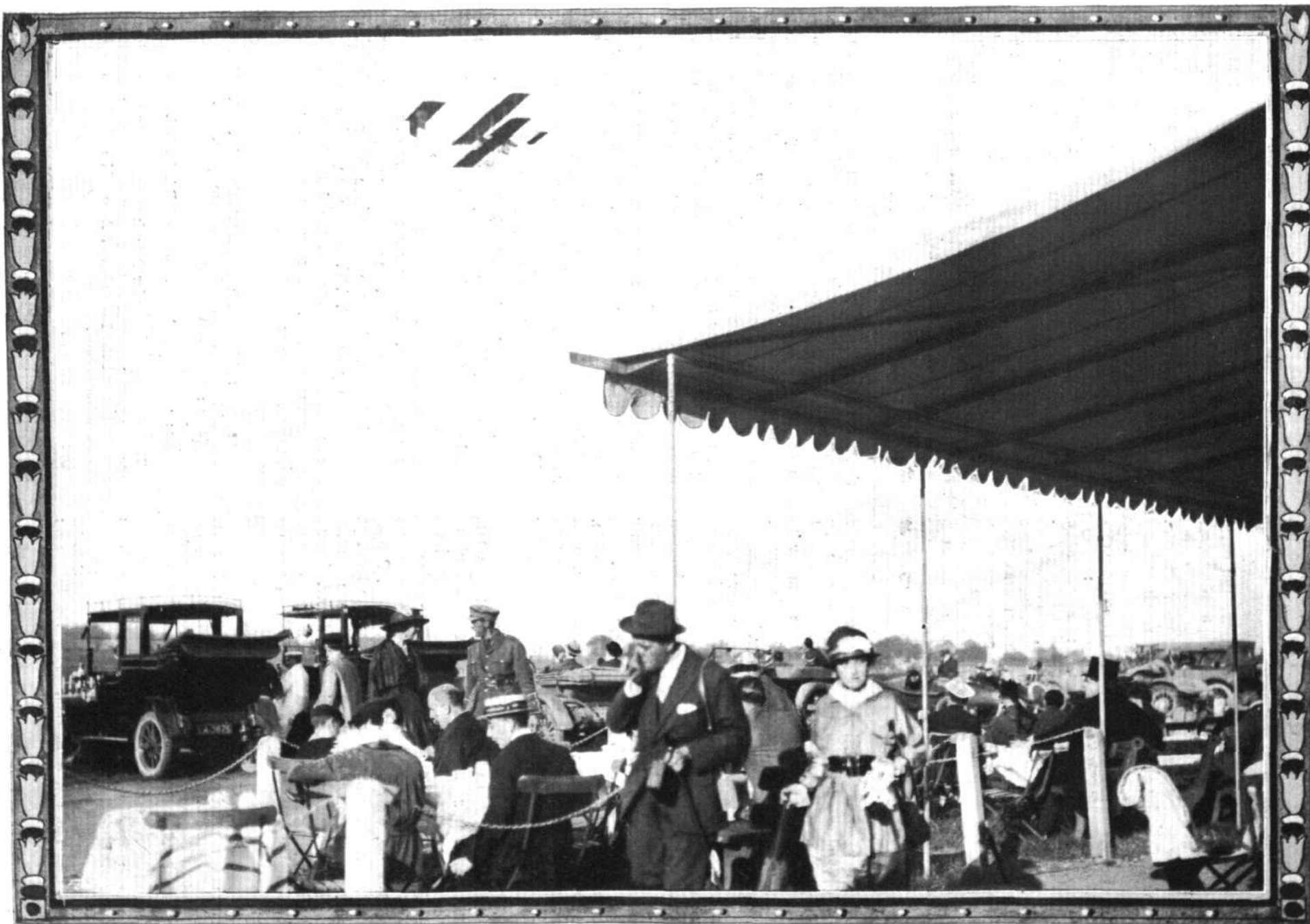
"A giant among pigmies," the correspondent says, "the mighty triplane, the latest achievement of French aviation, 'l'avion de bombardement' towers, dwarfing all other aircraft. With a spread of wing of 70 ft., the three superposed planes rise to the height of 20 ft. The body will comfortably hold 12 men, though six are to form the crew. There are two pilots with seats close together, in the centre of the car; but in emergency the machine can be handled by one man. Two observers and two naval gunners complete the crew. The armament consists of four 37 mm. (1½-in.) guns.

"This new superplane has an average speed of 80 miles per hour. Built at a cost which is trifling when compared with that of a Zeppelin, the plane has all the advantages of the latter, including that of stability, speed, relative carrying power, and endurance, and is infinitely less vulnerable. Hitherto nothing has been evolved in the field of aeronautics as significant as this new triplane. Graceful in outline, not in the least cumbersome notwithstanding great dimensions, it has all the constructional refinements of a yacht. Painted white, with the colours of France on the underside of the planes and tail, the analogy is striking.

"Having stood the severest tests, the superplane leaves for the front. The eyes of France and of the world will be fixed on this new creation of French genius. The officers with whom I spoke are convinced that a new phase of aerial warfare is about to begin. The bombardment of enemy positions by squadrons of aircraft of the type just described, it is asserted, will be even more efficacious than artillery."

That the French designers have decided on the triplane type for their large machine is not in the least surprising, in fact we ventured to predict, some time ago, that the solution of the problem of a really big machine would probably be found in this form of construction, which offers several advantages from the point of view of the relationship of strength and weight to area. As the average speed is stated to be 80 m.p.h., we take it that this is the normal flying speed of the machine with its full load of crew, ammunition and fuel, a speed which must be considered highly satisfactory in a machine carrying such an armament as does this one. No mention is made of the horse-power or the number of engines, but it is reasonable to suppose that to obtain the necessary power more than one motor is employed, especially as the results already obtained with the twin-engined Caudron biplanes have been eminently satisfactory. Although the radius of action of this latest fighting triplane is not stated, the last few lines in the extract from *The Times* correspondent's description

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A brilliant day brought a goodly gathering of visitors to Hendon on a recent Sunday, and tables for *al fresco* teas were in great demand. Our photo. shows the scene during the afternoon.

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seem to indicate that this is very extensive, and as the number of bombs that can be carried is undoubtedly very considerable, one may reasonably expect to hear some very good accounts of *l'avion de bombardement*.

Great and varied as will undoubtedly prove the capabilities of the large fighting machine, it is after all only suited for specific purposes, and as we have always held there are other types which must not be neglected. This is evidently fully realised by the French military authorities, who have also permitted inspection of its complement machine, the little fast single-seater scout, described as follows by the *Times* correspondent:—

"A fit companion of this great battle plane is the new destroyer. A biplane, with a spread of wing of 21 ft., measuring only 7 ft. from the ground to the tip of the upper plane, it is driven by a single motor. With a speed of 100 miles an hour, armed with a machine-gun which is operated by the driver, who at the same time must act as observer and pilot, this new swift airplane is destined to become the air scout and perform the tasks entrusted to destroyers at sea. In flexibility and ease of manoeuvre it surpasses all other types hitherto created. I saw an airplane rise almost perpendicularly from the ground to a height of 1,000 yards in 40 secs., and it can

be operated with safety by the pilot without using his hands, leaving him free to attack the enemy or make observations.

Although equally useful in its own particular sphere, the new French destroyer is of less interest to us, since this is a type of machine that was originated and highly developed in this country both before the outbreak of war and since. There is nothing very startling in the performances of the French scouts as stated, unless it be the climb of which it is said to be capable. 3,000 ft. in 40 secs. sounds somewhat ideal, but we should not like to say positively that it would be impossible of attainment.

As regards the progress of development in this country little is, as we have already pointed out, allowed to be generally known, but without giving away any information that would be likely to be of use to the enemy, we may repeat that within a measurable period we believe our own Services will have at their disposal machines which will enable full advantage to be taken of the enterprise and initiative of our service aviators.

CASUALTIES AMONGST GERMAN PILOTS.

IN one of our editorial articles figures are given of German flying pilots who have lost their lives since the opening of the present war. In analysing these several names have emerged which are more or less familiar to our readers, by reason of their past work in this country, or as recorded in the pages of "FLIGHT," in regard to altitude, duration and distance flights. We have made the following few notes in this connection which may prove of interest.

One of the first German military pilots to meet his death was Lieut. Werner von Beaulieu, who, it may be remembered, obtained second prize in last year's Prince Henry Circuit, in which he flew an L.V.G. biplane, 100 h.p. Mercedes engine. Lieut. von Beaulieu, who was born in 1882, secured his *brevet* (No. 291) in September, 1912, on a Bristol biplane, and in November of the same year he took a second ticket (No. 331) on a Bristol monoplane.

Lieut. Carganico, whose name appears among those killed, was one of Germany's best-known military pilots. He secured fifth prize in the Prince Henry Circuit of 1913, while in last year's P.H. Circuit he met with a flying accident early in the race and had to retire. A civilian pilot well known to all followers of aviation events is Otto Stiefvater, who with his passenger, Lieut. Pappe, was killed a little over a year ago in a flying accident at Jannowitz. Stiefvater learned to fly in 1912 on an Aviatik biplane, and after obtaining his *brevet*, joined that firm as instructor. Later he did a considerable amount of flying for Jeannin at Johannesthal, and on

September 16th, 1913, Stiefvater made a flight from Freiburg, in Breisgau, *via* Gotha and Elbing, to Konigsberg, a distance of 1,170 kilometres, which he covered in 13 hrs. 9 mins., at one time flying for 7 hrs. 40 mins. without landing. For this flight he received 10,000 marks from the "Nationalflugspende." He then joined the staff of Prince Sigismund of Prussia as chief pilot, and took part in the 1914 Prince Henry Circuit and the Round-Berlin race. For distinguished service on reconnaissance flights Stiefvater was decorated with the Iron Cross early in the war.

Another civilian pilot whose name appears in the casualty list is Werner Landmann, who is a prisoner of war in Russia. Landmann for a short time held the world's duration record for pilot only, by a flight of 21 hours 49 mins. duration on an Albatros biplane, 100 h.p. Mercedes engine. He was beaten a few weeks later by his compatriot Boehm, who, it may be remembered, raised the record to 24 hours 12 mins. The German pilot, Lieut. Otto Thelen, who is a prisoner of war in this country, should not be confounded with the well-known civilian pilot, Robert Thelen, who is, as far as one can ascertain, still busy testing new machines for the Albatros firm. Of other aviators who are prisoners of war with the French, one of the best-known is Lieut. von Hiddessen, who won the Prince Henry Reliability Trials in 1913 on a D.F.W. monoplane, and who during the early part of the war was the first German pilot to drop bombs on Paris, a feat for which he was decorated with the Iron Cross.

For Steel Research.

MEMBERS of the Society of Motor Manufacturers and Traders have promised £618 10s. towards the £1,000 guaranteed by the Society, provided the Government contribute £1,000 for research work in connection with steels, especially in connection with aeroplane engines.

The list of subscribers is:—

£100 each: Daimler Co., Ltd.; Wolseley Motors, Ltd.; Sunbeam Motor Car Co., Ltd.

£50: Messrs. John I. Thornycroft & Co., Ltd.

£25 each: Albion Motor Car Co., Ltd.; British and Colonial Aeroplane Co., Ltd.; J. & E. Hall, Ltd.; Humber, Ltd.; John Marston, Ltd.; D. Napier & Son, Ltd.; J. Samuel White & Co., Ltd.

£20: Handley Page, Ltd.

£10 10s. each: Rudge-Whitworth, Ltd.; Standard Motor Co., Ltd.; W. L. Stewart & Co., Ltd.

£10 each: Bristol Tramways and Carriage Co., Ltd.; Halley's Industrial Motors, Ltd.; White and Thompson, Ltd.

£5 5s.: Bowden Wire, Ltd.

£5: Dover, Ltd.

£2: Hoyt Metal Company of Great Britain, Ltd.

The list is still open.

The Admiralty and the War Office have appointed representatives upon the joint committee of the Society of Motor Manufacturers and Traders and the Institution of Automobile Engineers which has the matter in hand.

"Use and Abuse of Steels"

Is the title of a paper which Mr. J. H. Dickinson will read at the opening meeting of the new session of the Institution of Automobile Engineers. Although the paper will mainly refer to automobile work, doubtless much of the information will be applicable to aeroplane construction.

AIRCRAFT WORK AT THE FRONT.

OFFICIAL INFORMATION.

British.

General Headquarters, Oct. 11th.

"YESTERDAY eleven fights in the air took place, in nine of which our aviators were successful. One hostile aeroplane was driven to the ground in the enemy's lines, and was almost certainly destroyed. This morning another enemy machine was brought down in our lines. We lost one aeroplane."

French.

Paris, Oct. 5th.

"The dirigible Alsace, which left on October 2nd on a bombarding mission, has not returned to its point of departure. According to information from German sources, the dirigible was brought down near Reims, and the crew taken prisoners."

"During the night of October 3rd-4th, a Zeppelin flew over Chalons and dropped several bombs, causing some material damage."

Paris, Oct. 7th. Evening.

"One of our aviators in Champagne this afternoon fired on a German captive balloon, which fell in flames in the enemy's lines."

Paris, Oct. 10th. Evening.

"A German aeroplane brought down by one of ours fell in our lines in the forest of Puvenelle, to the south of Pont-à-Mousson. Both of its aviators were killed."

"One of our squadrons this afternoon dropped about a hundred large shells on the stations of the rear front of Champagne and on the enemy troops which were seen assembled there."

Russian.

Petrograd, Oct. 9th.

"German aeroplanes threw some bombs on Schlock."

"Our aeroplanes made a raid on the station of Czernovitz, and dropped several bombs on trains and munition depôts. A column of smoke and flame appeared immediately over the station. An enemy aeroplane rose from the Czernovitz station to engage our aviators, but quickly descended when fired at by our aviators."

Petrograd, Oct. 10th.

"A German aeroplane threw some bombs on the railway station of Nitzhal, north of Dvinsk."

"South-west of Dvinsk our artillery brought down a German aeroplane, which fell in the enemy lines."

Italian.

Rome, Oct. 8th.

"Austrian airmen dropped some bombs upon Rocchette, in the Astico Valley, without doing damage, and on the station of Cervignago, where five soldiers were slightly wounded."

Rome, Oct. 9th.

"A flotilla of fourteen of our aeroplanes yesterday dropped bombs on the headquarters of one of the Austrian high commands at Kostanjevica, on enemy encampments at Oppachiasella, and on the railway station at Nabresina. Notwithstanding the fire of numerous enemy anti-aircraft guns, our aeroplanes returned undamaged to our lines."

"An Austrian aeroplane dropped darts on one of our encampments, and a bomb on Cormons, without doing any damage."

Serbian.

Nish, Oct. 6th.

"Twenty aeroplanes flew over the region of the Lower Morava and Lava, and threw 30 bombs on Pojarevat and 3 bombs on Goritza. There were no casualties."

"An enemy aeroplane of the Taube type, coming from the direction of Zaetchar and Kraguievatz, flew over Nish, and then taking an easterly direction made off towards Bulgaria."

German.

Berlin, Oct. 11th.

"Our battle aviators yesterday destroyed four enemy aeroplanes. One English aeroplane fell to earth east of Poperinghe (west of Ypres). North-west of Lille Lieutenant Immelmann compelled an English battle biplane flying at a height of 13,000 ft. to descend. This officer has within a very short time brought down four enemy aeroplanes."

"In Champagne one French battle biplane was shot down near Somme-Py and another on the heights of the Meuse, west of Hattonchatel, both after a fight in the air. We lost an observation aeroplane south of the Bois le Prêtre."

"*Eastern Theatre of War.*—An enemy aeroplane was shot down west of Smorgon."

THE ROLL OF HONOUR.

THE Secretary of the Admiralty has announced the following casualties:—

Under date October 4th:

Injured.

Probationary Flight Sub-Lieutenant Howard C. Jevons, R.N.

Under date October 9th:

Injured.

Probationary Flight Sub-Lieutenant Arthur Handley, R.N.

Undated:

Wounded.

P.O. Mechanic B. J. N. Brady, R.N.A.S.

The following casualties in the Expeditionary Force have been reported from General Headquarters:—

Under date September 27th:

Wounded.

Lieutenant E. H. Mitchell, R.F.A. and R.F.C.

Lieutenant F. E. Hellyer, Hampshire Regt. and R.F.C.

Missing.

Captain F. B. Binney, R.F.A. and R.F.C.

Under date September 28th:

Wounded.

Lieutenant J. Cemlyn-Jones, Royal Welsh Fusiliers, 6th Batt. (T.F.), attached R.F.C.

Under date October 2nd:

Wounded.

Flight-Sergeant W. Burns, Royal Flying Corps.

Undated:

Missing.

Captain N. C. Spratt, Royal Flying Corps.

Correction:

Missing.

Second Lieutenant S. W. Caws, R.F.C., should read Lieutenant S. W. Caws, R.F.C.

THE BRITISH AIR SERVICES.

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

Royal Naval Air Service.

THE following appeared among the Admiralty announcements of the 7th inst. :—

Capt. (graded as Wing-Commander) F. R. Scarlett, graded as Wing-Captain, with seniority of Oct. 4th.

The following entries have been made :

Major A. O. French-Brewster (Motor Machine Gun Service) as Acting Flight-Lieutenant, with seniority of Oct. 4th, and appointed to "President," additional, for R.N.A.S.

H. W. Evens as Probationary Flight Sub-Lieutenant, for temporary service, with seniority of Oct. 6th, and appointed to "President," additional.

A. Raworth as temporary Lieutenant (R.N.V.R.), with seniority of Oct. 6th, and appointed to "President," additional, for Inspectional Duties.

C. H. Nelson as Temporary Sub-Lieutenant (R.N.V.R.), with seniority of Oct. 6th, and appointed to "President II," additional, for Wireless Telegraphy Duties.

THE following appeared among the Admiralty announcements of the 8th inst. :—

Sub-Lieut. B. Annoot (temporary, R.N.V.R.) promoted to Lieutenant, with seniority of Oct. 6th.

THE following appeared among the Admiralty announcements of the 11th inst. :—

The undermentioned have been entered as Probationary Flight Sub-Lieutenants, with seniority as follows: Temporary Lieut. (R.N.V.R.) J. H. Vickers (for temporary service); Oct. 1st. J. A. Smith; Oct. 10th. G. H. Bittles, J. J. de la T. Fox, and B. C. Tooke; all Oct. 17th.

THE following appeared among the Admiralty announcements of the 12th inst. :—

The following have been entered as Probationary Flight Sub-Lieutenants, for temporary service: B. Wemp, C. Darley, T. Stephens, R. Courtneage, and F. Henderson; Sept. 1st. A. Todd and G. Smith; Sept. 6th. H. Page; Sept. 3rd. G. Williams and E. Poller; Sept. 3. A. Harland; Aug. 28th. G. Fleming; Sept. 1st. B. Trechmann, L. Weil, F. Toms, and J. Marvin; Oct. 11th. A. McColl, G. Kilburn, and C. Studd; Oct. 17th.

Royal Flying Corps (Military Wing).

THE following appeared in a supplement to the *London Gazette* issued on the 6th inst. :—

Flying Officers.—Sept. 18th, 1915: Second Lieut. C. T. Black, Royal Warwickshire Regt., and to be seconded. Second Lieut. W. L. Robinson, the Worcestershire Regt., and to be seconded. Second Lieut. A. E. C. Archer, Buffs (East Kent Regt.), and to be seconded. Temporary Second Lieut. H. C. Wakefield, East Surrey Regt., and to be transferred to the General List. Second Lieut. A. G. L. J. Miller, Irish Guards, and to be seconded. Temporary Second Lieut. C. S. Wynne-Eyton, R.A., and to be transferred to the General List; Sept. 22nd, 1915.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: Stuart A. Laird and Herbert Lee.

To be Second Lieutenants (on probation): Leonard C. Kidd; Aug. 25th, 1915. Aug. 30th, 1915: Edward A. Richards and John P. Rowell, Geoffrey D. Pidgeon; Sept. 5th, 1915. Peter P. Eckersley; Sept. 20th, 1915. Richard P. J. M'Coy; Sept. 23rd, 1915. Norman Turner; Sept. 27th, 1915. Victor M. Wenner; Sept. 28th, 1915. William O. Russell; Oct. 7th, 1915.

THE following appeared in a supplement to the *London Gazette* issued on the 7th inst. :—

Memoranda.—Sergeants, from 19th Alberta Dragoons, to be Temporary Second Lieutenants, for duty with the Royal Flying Corps; Sept. 13th, 1915: F. C. Butler and H. C. Evans.

THE following appeared in the *London Gazette* of the 8th inst. :—*Flight Commander.*—Capt. W. F. MacNeece, Queen's Own (Royal West Kent Regt.). Sept. 9th, 1915.

Flying Officers to be Flight-Commanders (and to be Temporary Captains whilst so employed).—Sept. 25th, 1915: Lieut. H. F. Glanville, West India Regt.; Lieut. T. F. Rutledge, Special Reserve. Lieut. M. G. Christie, Special Reserve; Sept. 26th, 1915.

Supplementary to Regular Corps.—To be Second Lieutenants (on probation): Thomas W. Winter; Aug. 31st, 1915. Idwal O. Griffith; Sept. 5th, 1915. Henry S. Ebben; Sept. 13th, 1915.

The following appeared in a supplement to the *London Gazette* issued on the 9th inst. :—

Temporary appointments made at the War Office:

Deputy Assistant Director.—Major Alan D. Carden, R.E., from a Squadron-Commander, Royal Flying Corps, Military Wing. Sept. 1st, 1915.

Staff Captains.—Aug. 1st, 1915: Lieut. (Temporary Capt.) Percy R. Grace, Royal Flying Corps, Special Reserve, from an Equipment Officer; Lieut. Alexander G. Clark, Royal Flying Corps, Special Reserve, from an Assistant Equipment Officer. Major Clive Mellor, R.E., from a Flight-Commander, Royal Flying Corps, Military Wing; Sept. 1st, 1915.

Staff Lieutenants.—Second Lieut. Edward S. Skipper, Royal Flying Corps, Special Reserve, from an Assistant Equipment Officer; Aug. 1st, 1915. Sept. 1st, 1915: Qrmr. and Hon. Lieut. Walter J. D. Pryce, Royal Flying Corps, Military Wing. Second Lieut. Noel C. F. Francis, R.F.A., T.F.

Equipment Officer.—Second Lieut. H. E. Chaney, Lancashire Fus., from an Assistant Equipment Officer, and to be Temporary Captain whilst so employed. Sept. 21st, 1915.

Assistant Equipment Officers.—Second Lieut. E. S. Skipper, Special Reserve; June 12th, 1915. Second Lieut. S. A. Laird, Special Reserve; Aug. 1st, 1915. Temporary Second Lieut. P. B. Hunter, A.S.C.; Sept. 17th, 1915. Temporary Capt. L. Sadler, A.S.C.; Sept. 25th, 1915. Temporary Lieut. G. I. N. Deane, R.E., T.F.; Sept. 27th, 1915.

THE following appeared in a supplement to the *London Gazette* issued on the 11th inst. :—

Flying Officers.—Sept. 25th, 1915: Lieut. A. H. Jackson, the Sherwood Foresters (Nottinghamshire and Derbyshire Regt.), and to be seconded; Second Lieut. L. Kingdon, the Worcestershire Regt., and to be seconded; Second Lieut. R. Newman, Special Reserve; Second Lieut. A. S. C. MacLaren, King's Own Scottish Borderers, Special Reserve, and to be seconded; Second Lieut. E. H. P. Cave, A.S.C., and to be seconded.

Supplementary to Regular Corps.—Second Lieutenants to be Lieutenants: Cyril C. Wigram; Aug. 1st, 1915. Sept. 1st, 1915: Valentine W. Eyre and Colin Defries. Sept. 27th, 1915: Elliott L. Bingham and Herbert A. Oxenham.

To be Captains; Sept. 1st, 1915: Lieut. (Temporary Major) Edward N. Fuller. Lieuts. (Temporary Capt.) Thomas O'B. Hubbard, Cecil H. Saunders, James Valentine, Percy R. Grace, Alfred Huggins, Richard H. Collier, Francis C. Jenkins, Horatio C. Barber, John T. C. Moore-Brabazon, Ronald L. Charteris, Maurice B. Blake, Charles G. Bell, David E. Stodart, Lionel S. Metford, Norman C. Spratt, Victor A. Barrington-Kennett, Cyril C. Wigram, Tom V. Smith, Harold Blackburn, Malcolm McB. Bell-Irving, Robert Orme, Bentfield C. Hucks, Hon. William F. F. Sempill (Master of Sempill), Gilbert B. Rickards, Hereward de Havilland, Edwin L. M. L. Gower, Arthur V. Bettington, Gerald C. R. Mumby, Harold Burchall, Robert Loraine, Thomas F. Rutledge, and Malcolm G. Christie. Lieutenants: Gordon N. Humphreys, John R. Howett, Archibald G. Weir, Frederick L. Scholte, Frank S. Barnwell, and William H. T. Rampling-Rose.

The appointment of Gerrit Forbes to a Second Lieutenantcy, which appeared in the *Gazette* of June 12th, 1915, is cancelled as from Sept. 27th, 1915.

THE following appeared in the *London Gazette* of the 12th inst. :—

Flight-Commander.—Temporary Lieutenant Frederick H. Cleaver, and to be Temporary Captain whilst so employed. Oct. 1st, 1915.

Supplementary to Regular Corps.—Second Lieutenants (on probation) confirmed in their rank: Robert Newman and Wilfred H. Furlonger.

To be Second Lieutenants (on probation); Sept. 13th, 1915: William J. King, Francis S. Creswell, Bernard V. Grealy, and Clair St. Noble. Reginald Groves; Sept. 14th, 1915. Herbert M. Fulton; Sept. 20th, 1915. Philip K. Turner; Oct. 1st, 1915. D. S. C. Macaskie; Oct. 2nd, 1915. Oct. 4th, 1915. Charles G. Hetherington, Thomas C. Wilson, and Reginald A. Courtney. Frederick N. Grimwade; Oct. 5th, 1915.

Central Flying School.

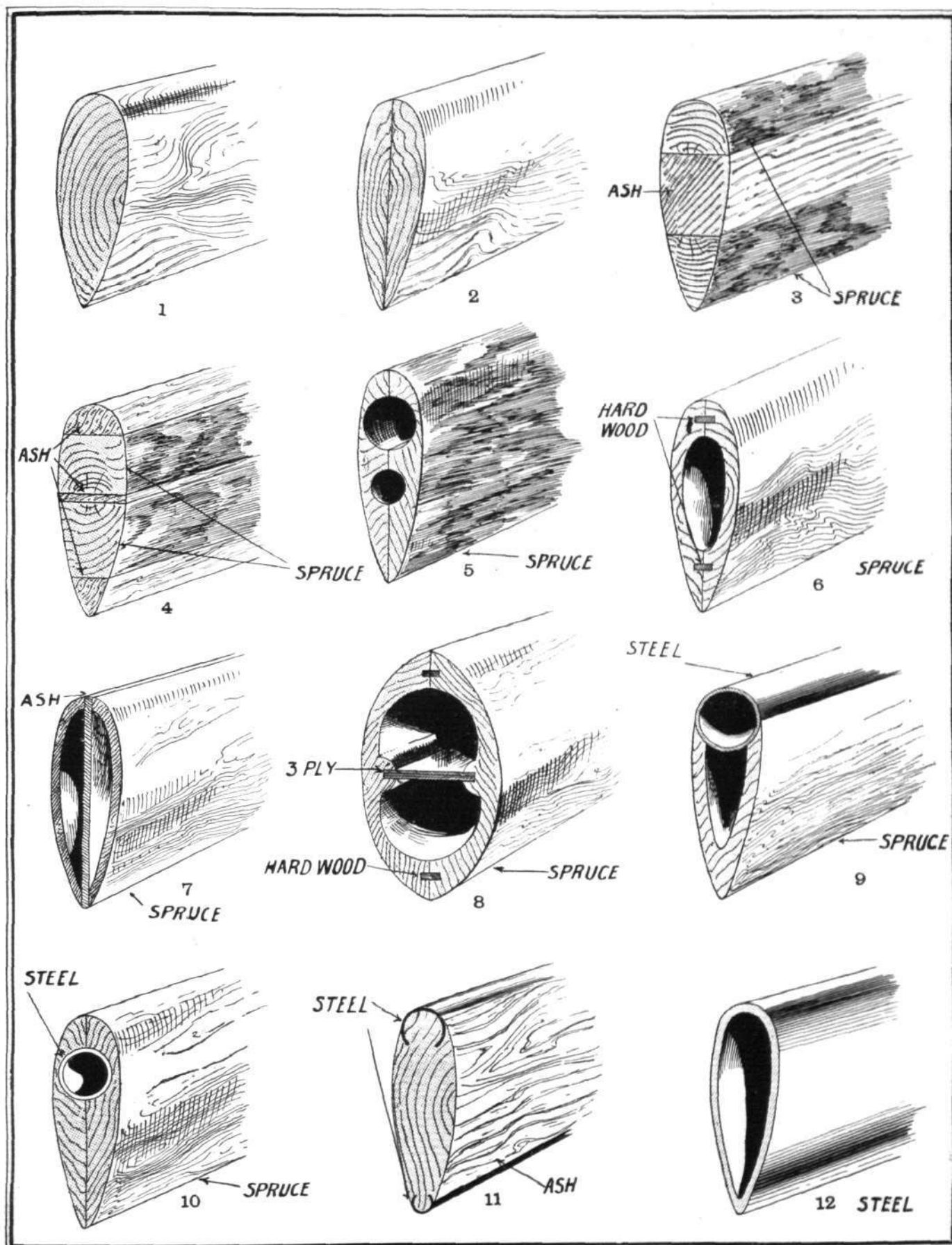
THE following appeared among the Admiralty announcements of the 5th inst. :—

Flight Lieut. H. S. Adams, granted acting rank of Flight Commander, with seniority of Oct. 4th, and appointed to "President," additional, for Central Flying School.

THE following appeared among the Admiralty announcements of the 11th inst. :—

Flight-Commander.—H. A. Littleton to "President," additional, for duty at Central Flying School, vice Busk. Oct. 10th.

CONSTRUCTIONAL DETAILS.—VI.



Various ways of building up streamline struts.

CONSTRUCTIONAL DETAILS.—VI.

HAVING illustrated in our last issue a number of different ways in which the main spars of an aeroplane wing may be built up, the subject of our sketches this week is the construction of the various struts of an aeroplane. The shape of these members is of course chiefly determined by aerodynamic considerations, *i.e.*, the question of low head resistance, and as unfortunately the section giving the best streamline form is, generally speaking, heavier for a given strength than one offering more resistance per unit length, or, expressing it in another way, a good streamline section is weaker laterally for a given weight than the inferior streamline form, the question arises how, by building up a strut of various materials, strength may be increased without adding to the weight.

It should be pointed out that in the sketches no attempt has been made to indicate the best section from an aerodynamical point of view, as this would be outside the scope of our present series of constructional details. What we are concerned with at present is the various ways in which a strut may be built up. The names of the constructors have not been given, as in many instances one and the same method is employed by a number of manufacturers.

Sketch No. 1 shows the simplest form of construction, in which the strut is machined from a solid piece of wood that may of course be any of the various kinds used, according to the purpose for which it was designed. In Fig. 2 is shown another form of strut which is solid in the sense that it is not lightened by being hollowed out. It is, however, built up of two pieces glued together, the method generally employed being to sew the piece from which the strut is to be made through lengthwise and then to turn one of the pieces round end to end so as to get the grain reversed. Sketch No. 3 shows a strut built up of three pieces, the nose and tail being made of ash and the centre portion of spruce. In Fig. 4 is illustrated a development of strut No. 3, in which the number of component parts has been increased to five, composed of a nose piece, a tail piece, and a centre piece of ash, and the remainder of the body of the strut made of spruce.

All the struts previously described are, it will be easily understood, somewhat heavy, and are, therefore, mainly employed where the strut is subject to heavy loads or

shocks, such as, for instance, in the undercarriage, or for inter-plane struts joined to the lower wing at the point where are attached the chassis members, in machines in which the undercarriage is secured to the lower wing instead of to the body.

When a lighter strut is required, there are two alternatives, one of which is to use the solid type of strut, but to reduce its depth and thickness, and the other is to employ a larger section, and to lighten it by means of hollowing out. Of these two, the latter method is generally chosen. One form of construction is shown in Fig. 5. On a spindle machine two grooves are made in each portion of the strut, leaving the centre part untouched, thus forming, when the two halves of the strut are glued together, a transverse web which strengthens the strut very considerably against lateral buckling. Strut No. 6 is built up of two halves joined together by means of a fillet of hard wood, the joint being of course glued. In strut No. 7 the centre is formed by a longitudinal web of ash, to which is secured two cheek pieces of spruce. Sketch No. 8 shows yet another form of hollow strut in which the two halves are glued together, while a transverse web is formed by a strip of three-ply wood let into the recesses in the sides of the strut.

In addition to the old wood strut a combination of wood and steel is frequently employed. One form is illustrated in No. 9, and consists, as will be seen, of a steel tube to which is attached by means of bindings at certain intervals a fairing of wood. A better streamline section may, however, be obtained by enclosing the steel tube in a wooden casing, as shown in Fig. 10. Here the two halves of the wooden casing have machined in them recesses for the reception of the steel tube, over which they fit closely when glued together. In all hollow struts it is general practice to leave a strut solid at certain intervals for purposes of strength. A somewhat unusual form of strut is illustrated in Fig. 11, where the nose and tail of the strut are formed by steel tubes that are not quite closed on one side and are pushed into grooves in the wood. All-steel construction has frequently been used, both for interplane struts and chassis struts. It usually takes the form of a cold drawn steel tube, that may either be of elliptical section or of the form shown in Fig. 12.



An American seaplane.—One of Glenn Martin's latest machines equipped with a 125 h.p. Hall-Scott 6-cyl. motor. This seaplane is said to be capable of lifting a useful load of 1,000 lbs., and to have a radius of action of 525 miles.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Aviators' Certificates.

THE following Aviators' Certificates have been granted :—

- 1820 Flight Sub-Lieut. Arthur Edmond Hawker, R.N.A.S. (Maurice Farman Biplane, Royal Naval Air Station, Eastbourne). Aug. 20th, 1915.
- 1821 2nd Lieut. Frank Harold Furness-Williams, R.F.A. (Maurice Farman Biplane, Military School, Birmingham). Sept. 5th, 1915.
- 1822 Capt. Charles Goodwill Davidson (42nd Battalion C.E.F.) (Maurice Farman Biplane, Military School, Farnborough). Sept. 24th, 1915.
- 1823 Lieut. James Bogue Elliott (6th Rifle Brigade) (Maurice Farman Biplane, Military School, Shoreham). Sept. 26th, 1915.
- 1824 Flight Sub-Lieut. Reginald Rhys Soar, R.N.A.S. (Grahame-White Biplane, Royal Naval Air Station, Eastbourne). Oct. 1st, 1915.
- 1825 Frank George Pinder (Maurice Farman Biplane, Military School, Brooklands). Oct. 2nd, 1915.
- 1826 Denis Cox (Maurice Farman Biplane, Military School, Brooklands). Oct. 3rd, 1915.
- 1827 2nd Lieut. William Henry Thorp Long (Dorsetshire Regt.) (Maurice Farman Biplane, Military School, Birmingham). Oct. 4th, 1915.
- 1828 Warrant Officer George Bowen, R.N. (Grahame-White Biplane, Royal Naval Air Station, Chingford). Oct. 4th, 1915.
- 1829 2nd Lieut. Joseph Cruess Callaghan (7th Royal Munster Fusiliers) (Maurice Farman Biplane, Military School, Norwich). Oct. 4th, 1915.
- 1830 2nd Lieut. Frank Neville Hudson (The Buffs) (Maurice Farman Biplane, Military School, Farnborough). Oct. 6th, 1915.
- 1831 2nd Lieut. Arthur Edward Kennedy, R.F.C. (Maurice Farman Biplane, Military School, Farnborough). Oct. 6th, 1915.
- 1832 Lieut. William Ewart Gladstone Murray (Highland Light Infantry) (Maurice Farman Biplane, Military School, Norwich). Oct. 6th, 1915.
- 1833 2nd Lieut. David Mary Tidmarsh (4th Royal Irish Regt.) (Maurice Farman Biplane, Military School, Ruislip). Oct. 7th, 1915.
- 1834 Flight Sub-Lieut. Jack Henry Woolf Barnato, R.N.A.S. (Maurice Farman Biplane, Royal Naval Air Station, Eastbourne). August 20th, 1915.
- 1835 Lieut. Charles Benjamin Wilson (10th Royal Hussars) (Maurice Farman Biplane, Military School, Shoreham). Sept. 7th, 1915.
- 1836 Flight Sub-Lieut. Charles Teverill Freeman, R.N.A.S. (Grahame-White Biplane, Royal Naval Flying School, Eastchurch). Sept. 7th, 1915.
- 1837 Lieut. Cecil Roy Leonard Falcy (4th Royal Berkshire Regt. (T.)) (Maurice Farman Biplane, Military School, Birmingham). Oct. 6th, 1915.
- 1838 Flight Sub-Lieut. William Stewart Stewart, R.N.A.S. (Maurice Farman Biplane, Central Flying School, Upavon). Oct. 6th, 1915.
- 1839 Lieut. Victor Osborne Rees (23rd London Regt.) (Caudron Biplane, Ruffy-Baumann School, Hendon). Oct. 7th, 1915.
- 1840 Leonard Henry Rochford (L. and P. Biplane, London and Provincial School, Hendon). Oct. 7th, 1915.
- 1841 Flight Sub-Lieut. Norman Carter Blanch, R.N.A.S. (Grahame-White Biplane, Royal Naval Air Station, Eastbourne). Oct. 7th, 1915.
- 1842 Corporal Maurice W. Piercey, R.F.C. (Maurice Farman Biplane, British Flying School, Le Crotoy, France). Oct. 7th, 1915.
- 1843 Stanley Seward Halse (Maurice Farman Biplane, Military School, Birmingham). Oct. 8th, 1915.
- 1844 Lieut. Earl Webster Farrow (Maurice Farman Biplane, Military School, Birmingham). Oct. 8th, 1915.
- 1845 Lieut. Geoffrey Foster Bone (Devonshire R.E. (T.F.)) (Maurice Farman Biplane, Military School, Birmingham). Oct. 8th, 1915.
- 1846 Sergt.-Maj. Henry Tom Hamilton Copeland, R.F.C. (Maurice Farman Biplane, Military School, Ruislip). Oct. 9th, 1915.
- 1847 2nd Lieut. John Edridge Pike (13th Durham Light Infantry) (Maurice Farman Biplane, Military School, Birmingham). Oct. 9th, 1915.
- 1848 Flight Sub-Lieut. Bernard Richards Lee, R.N.A.S. (Grahame-White Biplane, Royal Naval Air Station, Eastbourne). Oct. 9th, 1915.

Aeronauts' Certificates.

The following Aeronauts' Certificates have been granted :—

- 45 Lieut. Frederick Holden Cleaver (20th Hussars). Sept. 5th, 1915.
- 46 Lieut. Stamford Cecil Raffles (3rd Royal Welsh Fusiliers). Sept. 5th, 1915.

Extension of the Hours of Opening the Club.

The Club is now open from 9 a.m. to 10.30 p.m. each day, including Sunday.

THE FLYING SERVICES FUND administered by THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The Fund is intended for the benefit of all ranks, but especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 166, Piccadilly, London, W.

Subscriptions.

	£	s.	d.		£	s.	d.
Total subscriptions received to October 6th, 1915	9,628	7	5	Collected at the Westland Aircraft Works, Yeovil (Fourth contribution)	1	1	6
Capt. Lord Napier and Ettrick	1	1	0	Martinsyde, Ltd.	50	0	0
"Anonymous"	100	0	0				
Babcock and Wilcox, Ltd.	5	5	0	Total, October 13th, 1915	9,785	14	11
166, Piccadilly, W.				B. STEVENSON, Assistant Secretary.			

Royal Flying Corps Reorganisation.

THE reorganisation of the Royal Flying Corps foreshadowed recently by the promotion of several officers to the rank of brigadier-general is further explained in the October Army Orders. It is announced that the corps will in future be organised in brigades, each brigade being composed of two or more wings. The Administrative Wing, Royal Flying Corps, will remain outside the brigade organisation, and continue to be administered as a separate unit.

To Assist French Air Minister.

To assist the new French Minister of Air Services, a consultative Committee of experts has been formed. M. Esnault Pelterie is the chairman, and other members include M. Deutsch de la

Meurthe, president of the French Aero Club; M. Renault, M. Clement Bayard, and M. Eiffel.

An Aeroplane from Trinidad.

THE Trinidad Chamber of Commerce (Incorporated) of Port-of-Spain, Trinidad, British West Indies, has pledged itself to present at least one aeroplane to the British Government for active service.

And Two More from Ceylon.

It has also been announced that a second military aeroplane has been presented to the War Office by Ceylon, while subscriptions are being collected with a view to providing a third machine.



London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Straights with instructor last week: Probationary Flight Sub-Lieuts. Aplin, Biscoe, Corry, Davenport, Davies, Gammon, Graham, Hackman, James, Man, Sadler and Till. Straights alone: Probationary Flight Sub-Lieut. Biscoe. Circuits with instructor: Probationary Flight Sub-Lieuts. Biscoe, Cross, Davies and James.

Instructors: Messrs. Manton and Winter.

Grahame-White Civilian School.—Straights with instructor: Messrs. Fraser, Hughes, Howe, Jones and Ellis. Circuits alone: Mr. Ellis.

Ticket during week: Mons. De Meulemeister.

Instructor: Mr. Russell.

Beatty School.—Pupils out during last week:—Messrs. FitzHerbert (15 mins.), T. Jones (15), Baker (10), Begg (35), Bowick (10), Brown (58), Brynildsen (10), Campbell (15), Collett (14), Collier (37), Cowper (52), Cumming (20), Davison (10), Duffus (36), Fawcett (24), Hodgson (40), L. F. Jones (15), Kirkwood (20), Lashmar

(28), Mellings (34), Murdoch (10), Nash (25), Nicholson (44), Overton (10), Owen (10), Patterson (50), Podmore (30), Stagg (20), Symington (50), Thompson (10), Halford-Thompson (15), Tremlett (15), and Whincup (25).

The instructors were Messrs. G. W. Beatty, W. Roche-Kelly, R. W. Kenworthy, G. Virgilio, and A. E. Mitchell, the machines in use being Beatty-Wright dual-control and single seater propeller biplanes and Caudron tractor biplanes.

Exhibition flights were given on Thursday and Saturday by Messrs. W. Roche-Kelly and G. Virgilio, and three passenger flights were taken.

Hall School.—The following pupils received instruction during the past week:—With H. F. Stevens: A. Watson. All doing circuits, figure eights, and *vol planés*. With C. M. Hill: Messrs. Bangs, Seward, Butterworth, B. Watson, Brandon, Hall, Wilkins, Hamer, Drew, Broad, Stirling, and Punnett. With Charles Bell: Messrs. Nicolle, Dodd, Wooley, Shum, Bond, Dresser,



Some Pupils who have taken their certificates at the Beatty School of Flying, Hendon Aerodrome.—1. Flight Sub-Lieut. J. F. Roche, R.N.A.S. 2. Mr. W. L. Eaton. 3. Mr. P. V. Fraser. 4. Mr. H. A. B. Robb. 5. Mr. G. L. Rutherford. 6. Mr. Yin Khean Leong (Chinese subject). 7. Mr. F. W. R. Banks. 8. Mr. A. Boyesen.

Capt. Grey, Evans, Ackroyd, Manley, Lieut. Bell, Camberbirch, Rattray, and Mann.

A. Watson took his ticket in a most masterly manner during a gale of wind. The following pupils are almost ready to qualify: Messrs. Broad, Brandon, and B. Watson.

Machines in use: Hall (Government type) tractor biplanes.

London and Provincial Aviation Co.—Instructors: Messrs. M. G. Smiles, W. T. Warren, G. Irwing and C. Jacques. Pupils doing rolling last week: Messrs. Woods, Scott, Hordern, Littel, Law, Lees, Northrop and Roberts. Doing straights: Messrs. Knowles, Farrow, Lewis and Lander. Doing circuits and eights: Messrs. Rochford, Medaets, Dalrymple and Franklin.

Certificates have been taken by Messrs. S. Dalrymple and L. H. Rochford, who both passed their tests well.

Ruffy-Baumann School.—The following pupils successfully passed their certificate tests last week: Lieut. R. Clive Gallop, Lieut. V. O. Rees, and Lieut. W. E. Gardner, R.N.A.S.

The remaining pupils have been practising as follows:

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It was a strange experience, walking boldly up to the bookstall "somewhere on the coast somewhere in England," buying a copy of last week's "FLIGHT"—yes, actually paying 3d. for it!—and reading, not without a feeling of curiosity and anxiety, "Flying at Hendon." Imagine a certain actor-manager—*incognito*—buying a seat in the stalls of his own theatre and witnessing someone else acting his special part which he had been playing for years, of the like said to be possessed by donkeys, and there you have it. I must admit that this experience—at least, the latter part of it—was pleasing, and my colleague, in so kindly acting as deputy for me, certainly acquitted himself very well indeed—for a first attempt! However, considering his threat about my losing my job, I think it was hardly the thing that he should, on my return to harness on Monday, greet me with "Oh, there you are, I will just tell you what happened at Hendon on Saturday and Sunday, and you can write it up." It was in vain I argued that it would not be "cricket" to describe what I had not seen; he said there was no need to worry about such a quixotic reason as *that*. I hae ma doots whether he really attended the 'drome himself at all. Anyway, here are the events as he says they were.

Saturday, I understand, was a cold bleak day, and he felt the cold very much indeed, poor fellow. He met Second Lieut. R. J. Lillywhite, who told him an awfully good story about — what? the flyers? Quite right. Well, Marcus D. Manton, J. S. B. Winter, and M.

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Capt. Fairbairn-Crawford, Messrs. de Grauw, Willy Coppens, Stuart Cole, H. Griffith, Hugh Cuthbertson, Lieut. Tomson, Messrs. Harkness, Tagg, Bolton, Stewart, May, Bailey, Lieuts. Ball, Barnard, and Prothero.

Instructors: Edouard Baumann, Felix Ruffy, Clarence Winchester, and Ami Baumann.

Many passengers have been carried by the various school pilots, and much work has been achieved in the workshops by Messrs. Cole, Sherwood, and Liddell particularly.

Northern Aircraft Co., Ltd.

The Seaplane School, Windermere.—The weather last week was very unsettled and bumpy. With instructor: Barber (20 mins.), Coats (34), Lindner (7), Robertson (26), Ridgway (9), and Yates (22). With instructor as passenger: Lawton (15 mins.), Part (11), Robertson (15), and Ridgway (14). Solo: Reid (9 mins.).

Instructors: W. Rowland Ding, J. Lankester Parker, and W. Laidler. Machines in use: N.A.C. 80 Gnome.

Several passengers carried.

Osipenko were (he thought) very busy with passengers on the 50 h.p. G.-W. school 'buses, and Osi (he has a rather familiar way of speaking sometimes) also flew the five-seater aero 'bus, and, by-the-bye, G. Virgilio came out on the 45 h.p. (at least, he thought it was the 45 h.p.) Beatty-Caudron, and W. Roche-Kelly stunted around on the Beatty-Wright. Sydney Pickles told him a rather funny yarn—. Were there any other pilots out? Oh yes, J. H. Moore brought out his 50-55 h.p. 'bus, and made a fine extended flight, climbing to 3,700 ft., descending with a beautiful spiral v.p. (whatever that may be) and making a splendid landing . . . and then he had tea; no, he did not think anybody else went up—oh, wait a bit, the Mann biplane came out, but he did not think it went up; no, he was certain it did not. He saw a Curtiss come down, but could not say whether it went up or not.

Sunday, he told me, was blowing like a place where I should think they would be very glad of a little wind. He did not know what he went to Hendon for, except that something would surely happen there if he did not. Oh yes, something *did* happen; Mann brought out the Barrs machine (that is what he said, but then there are one or two bars up there, you know), and made a splendid 10-minute flight, climbing to about 1,000 ft. in the evening (well into the evening, you see), and Osi—there it is again—tried one or two straights on the school 'bus (in the school 'bus across the aerodrome, I suppose he means), and that is all. (And about time.—ED.)

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features in or near the approaches to towns and populous districts, which may afford landmarks for the guidance of enemy aircraft, must be regarded as likely to assist the enemy, and as such, coming under Regulation 18 of the Defence of the Realm Regulations, which forbids the collecting, recording, publishing, or communicating of such information.

Photographs, &c., of Landmarks, &c.

AN instruction issued by the Press Bureau on Saturday night, at the request of the War Office, states that picture postcards or photographs representing docks and harbours, shipyards, defences, ammunition works, prominent buildings, monuments, or other



WHO would like a really valuable pedigree Pekinese puppy? I was almost going to write, don't all speak at once, but, on mature reflection, the more the merrier, say I. For this reason, that anybody in gratifying their wishes for one of these unique companions will be doing a good turn to our flying heroes "out there," or their dependents—*via* the Flying Services Fund under the administration of the Royal Aero Club. And it comes about in this way.

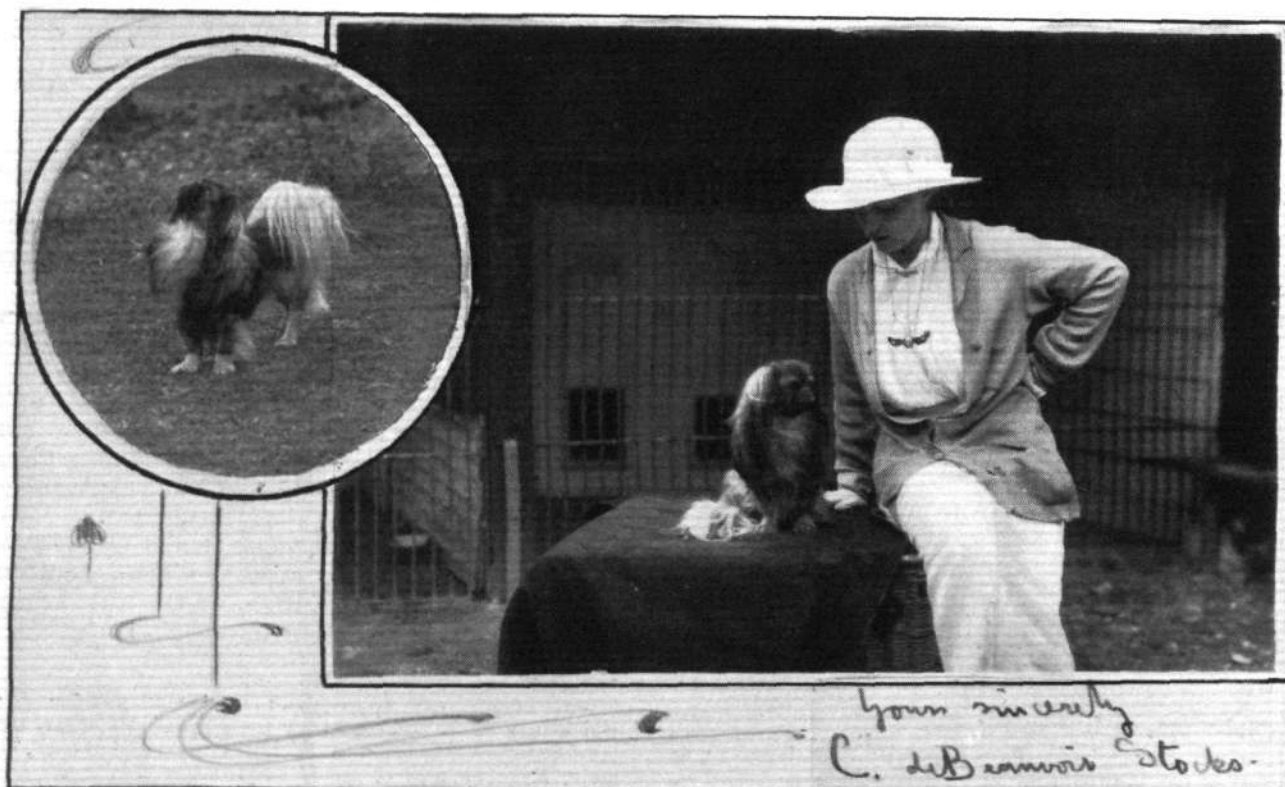
A few weeks ago I mentioned the good news that Mrs. de Beauvoir Stocks was once again a welcome personality at Hendon Aerodrome, and was looking a good deal more like herself as most of the Hendon *habitués* knew her in the past. Judging by a very cheery letter to hand this week from Mrs. Stocks, it looks as if she were even more herself than I thought for, and it is with sincere joy that I pass on the glad tidings to the readers of "FLIGHT." Moreover, as of yore, Mrs. Stocks has ever thoughts of others, and to her the welfare of those in the Flying Services is a care natural to her nature. One absorbing occupation for her is her kennel of pedigree Pekinese dogs, and as an outcome of this hobby, she proposes to benefit the Flying Fund by offering a litter of three puppies of this famous breed—either separately or as a trio—at a price. Here is therefore a chance for that good turn to which I referred in my opening paragraph.

Mrs. Stocks' letter, which follows below, conveys her idea in the simplest form, whilst it carries with it to all those who knew her a message of cheerfulness, which in these times may well stand as an example to many who have not had the same terrible experience—close communion with death—like that which has fallen to the lot of Mrs. Stocks.

Thus Mrs. de Beauvoir Stocks:—

"I enclose two photos. of Peter, which I hope you will publish. His daughter 'Cliobana' has three puppies, by Koo-joo, and I am going to sell them for the Flying Fund. What offers? As you have remarked, I am much better, and, curiously enough, it is ever since the air-raid at — (censored). Imagine five forts firing, and pom-poms in the harbour, and you'll realise it *was* rather noisy! But my right side is still paralysed, and I write with my left hand, &c. I will, of course, let you know when the puppies are sold."

Now then, what offers? These can either be sent to the Editor of "FLIGHT," when they will be duly acknowledged, or they can be sent direct to Mrs. C. de Beauvoir Stocks, at Westcombe, Evercreech, Somerset. And we hope the sum realised will be a record, even for Pekinese pups. All our readers can see the sort of breed they are bidding for in the two photos. of Peter sent by Mrs. Stocks, which appear on this page, and I can promise the



Mrs. C. de Beauvoir Stocks and Peter.—Inset, "Who said Zeps.?"

lucky purchasers that they need not fear due acknowledgment in writing from Mrs. Stocks herself; just glance at her left-handed writing and signature, reproduced under her portrait with her dog.

x x x

While all readers of "FLIGHT" are acquainted with the abilities of Mr. E. C. Gordon England as a first-class pilot and successful aeroplane designer, and lately as an aeroplane constructor, it has not been generally known that he had designs, literally speaking, on motor body building. Mr. England, has always, he tells me, had a notion that he could get out the lines of a decent motor body if he were to try, and recently he has put his idea to the test. The result is seen in the accompanying photograph of Mr. Gordon England in his little "Baby Peugeot" taken up at Hendon the other day when he paid the old haunt a visit for the first time in several months. This absence has been rather



Mr. E. C. Gordon England in his "Baby Peugeot," the body of which was designed by Mr. Gordon England himself.

enforced, as Mr. England has had his hands so full that it is only at long intervals that he allows himself a "day off." A glance at the "lines" of Baby Peugeot must convince the eye that the designer has not missed much in attaining his end. It is by no means easy to obtain the exact balance in this car owing to its diminutive size, as it may easily be made to look "top heavy" if great care is not exercised in the proportions of each part of the body. It is quite conceivable that Mr. England's knowledge of aeroplane design and the laws governing the flow of air round solid substances has largely influenced the graceful features of his work without having to resort to the alleged streamline bodies so closely associated with racing cars.

x x x

While meandering around recently in the enclosures at Hendon as is my wont at frequent intervals, I heard laughter and voices issuing from one of the little huts near the old Press Club, where, in the good race days ago, fellow scribes were wont to assemble to talk shop over a —, well, you must remember that this was in the days before one had to curb one's inclinations to provide liquid refreshments for all and sundry. Well, as I was saying, I heard voices and laughter from the little cabin, and my professional curiosity overcame my inborn timidity of poking my nose in where there is an unwritten but nevertheless very effective "Verboten" written over

the door. To a gatherer of news the old axiom is transcribed "Get the news honestly if you can, but get it," and accordingly I approached the hut inwardly somewhat shaky, but with, I trust, a bold front, and opened the door. As luck would have it, there was nothing very unorthodox in my action, although for this I claim no credit, as I found the cosy little cabin occupied by Mr. S. Pickles, who was in the thick of a discussion aeronautical with some friends. I was soon comfortably seated behind a good smoke, and mine host explained to me that he had got the use of this little cabin for the few and short intervals between testing Curtiss tractors.

x x x

A propos this latter little pastime, Pickles is kept so busy now at the job that he has been compelled to call in the services of an understudy to help him through with some of the machines, and to act as his understudy in this regard, under emergency, and here Pickles' luck serves him in good stead, as in Mr. C. B. Prodger a very capable assistant has been annexed, who will know how to get at the best results of the 'buses, and, thereby, by increasing the number tested, help towards an acceleration of the machines available for our service pilots.

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Being in the air so many hours daily, and with colder weather getting nearer, Pickles has found it a bit keen upstairs. Especially have the exposed portions of his face been inclined to suffer, and to remedy this trouble he has had a mask made which protects his face very thoroughly and yet allows for breathing comfortably. The accompanying "portrait" shows his new form of head-gear—hardly suggestive of the romantic, except of the fearsome order. One might imagine that such a mask



The latest portrait of Mr. Sydney Pickles, as attired for winter aeroplane testing. For details of what has brought about the change in Mr. Pickles' appearance, see the text.

would hinder the wearer in his work, besides wiping out his good looks. But demonstration speedily laid this theory by the heels when Pickles took one of the Curtisses up and did some alarmingly steep-banked turns at what seemed to me to be a none too safe altitude.

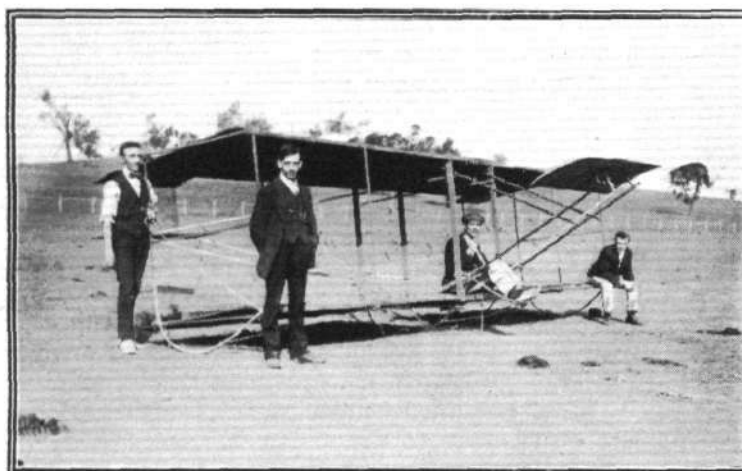
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A friend of mine, who is in some way connected with the "fillum" trade was getting a roll of some scenes staged "somewhere in France," and the camera man had just started a new reel for the immortalisation of a particularly interesting scene. So busy was he looking in his view finder that it was not until the hero committed the unpardonable sin of ceasing to make love to the heroine in order to gaze towards the sky, that he noticed a German aeroplane overhead with little bursts of smoke all around it, indicating that it was being marked down. The filmist is now on tenter hooks until

now, of course, because of the war; a number of the members have sailed with the Australian Flight for active service.

"Enclosed are photos of a few of the members with a glider, which was presented to the club by Dr. F. M. Johnson, who is now, we believe, in England. It had then no front elevator or vertical fin and was controlled by movements of the operator. It takes a good deal of wind to get it off, but is all the better for that in the air for a beginner, because of its inertia. We have been using it on a fairly steep slope and each operator, as he took the landing bump with set teeth, wished ardently for the power to increase the lift co-efficient if only for the last two seconds.

"We get just sufficient time in the air to make us hate the idea of coming to earth, and long to open a throttle and soar over the hills; it is tantalizing when we know



The glider and some of the members of the Victoria Aero Club, Melbourne.—On the right, the glider in flight.

he has developed the film for fear the aeroplane has been included in his pretty little love scene which was, unfortunately, staged in medieval surroundings with the hero clad in shining armour.

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From Mr. C. A. Wragg, hon. sec. of the Victoria Aero Club, Melbourne, the following interesting letter has arrived, relating how a few enthusiasts down that part of the world are "doing their bit" for the furtherance of aviation, albeit only in a small way yet:—

"The club was formed some twelve months ago by a few keen and kindred spirits, and has since been steadily growing. The meetings are held monthly, at which we generally manage to put in an interesting evening. At our next meeting a paper will be given by Mr. G. Hawker, on aero engines. We propose, as a club, to construct and experiment with gliders, to popularise gliding as a sport, to establish a library on the subject for the use of members, and, in fact, to do anything that will tend to promote interest in aviation. Very little can be done

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Another Honour for the R.F.C.

In a supplement to the *London Gazette* issued on the 9th inst. it was stated:—

His Majesty the King has been graciously pleased to approve of the award of the Distinguished Conduct Medal to the under-mentioned non-commissioned officer for gallantry and devotion to duty whilst serving with the Expeditionary Force:—

Corporal T. BENNETT, Royal Flying Corps.

For conspicuous bravery and skill on September 13th, 1915, over Bois de Biez. While on patrol duty, with Second-Lieutenant H. S. Shield, at an elevation of about 10,000 ft., a German albatross was sighted. The officer dived towards it, and engaged it at about 7,000 ft. While diving they were subjected

to heavy anti-aircraft gun fire. The Germans used during the engagement a machine-gun very conveniently mounted, but Corporal Bennett handled his gun with great coolness and skill, and succeeded in disabling the German machine, which side-slipped, nose-dived and came to ground in our lines.

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"By the way, we've discovered a simple formula for the solution of flight problems; it is WPP^2 —work multiplied by patience and perseverance squared.

"In closing, allow me to tender a personal appreciation of "FLIGHT"; to me it is a completely satisfying journal from "Eddies" chat to the articles contributed by the various scientists."

On behalf of "FLIGHT" I beg to thank Mr. Wragg for his good wishes, and will reciprocate by expressing the hope that he and his fellow workers will soon be fortunate enough to find a sportsman willing to furnish the means wherewith to put into effect a much simpler formula for the solution of flight problems, to wit—H.P.

"ÆOLUS."

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to heavy anti-aircraft gun fire. The Germans used during the engagement a machine-gun very conveniently mounted, but Corporal Bennett handled his gun with great coolness and skill, and succeeded in disabling the German machine, which side-slipped, nose-dived and came to ground in our lines.

And One for the Australian R.F.C.

It was similarly announced that the D.C.M. had been awarded to Staff Sergeant C. V. HEATH, Australian Flying Corps.

For conspicuous pluck and determination in Mesopotamia on August 1st, 1915. He assisted to pole a "bellum" (long flat-bottomed boat) 28 miles in 12 hours in most intense heat, in order to rescue aviators who had been forced to descend in the enemy's country.

SOME AMERICAN AERO ENGINES.

THE JOHNSON TWO-STROKE.

INASMUCH as reliability, simplicity and lightness—the most important requirements of an aero engine—are the principal features claimed for the two-stroke motor, it is rather surprising that the latter has not been developed more than it has in connection with aeronautics. Although with the few two-stroke motors there are in use it must be admitted there is room for improvement as far as petrol consumption, &c., is concerned, the general results obtained justify further development. One firm in the States that is devoting its entire attention to two-stroke aeromotors is Johnson Bros., of Terre Haute, Indiana. Four models are manufactured, all V type with cylinders set at 90°, as follows: A 4-cylinder 50–60 h.p., a 6-cylinder 75–90 h.p., and 8-cylinder 100–120 h.p. and a 12-cylinder 150–180 h.p. All have a bore of 5 ins. and a stroke of 4 ins., and run at 1,150 to 1,400 r.p.m., in fact they differ from each other only in the number of cylinders and constructional details rendered necessary by the additional cylinders, most of the parts being interchangeable.

A difficulty common with most two-stroke motors is

plugs are located in the centre of the cylinder heads, the magneto being mounted on the end of the crankcase, where it is driven by bevel gear from the crankshaft. The cooling water is circulated by means of a pump driven from the other end of the crankshaft. The aluminium crankcase is of the barrel type cast in one piece with removable end-plates, through which the crankshaft may be removed. Besides the main phosphor-bronze bearings at each end of the crankshaft the latter is supported by a bearing, also phosphor bronze, between each crank throw. The crankshaft is of chrome nickel steel. Lubrication is effected by mixing the oil and the petrol together in the same tank, a mixture of fuel and oil being fed to the carburettor by gravity. The proportion of petrol to oil used is about one gallon of the former to one pint of the latter.

One of the 8-cylinder models was subjected to a ten hours' test some little while back with, it is stated, the following results. A propeller 8 ft. diameter, 6 ft. 8 ins. pitch, was fitted to the engine shaft and the engine was mounted in a test bench. The average engine speed

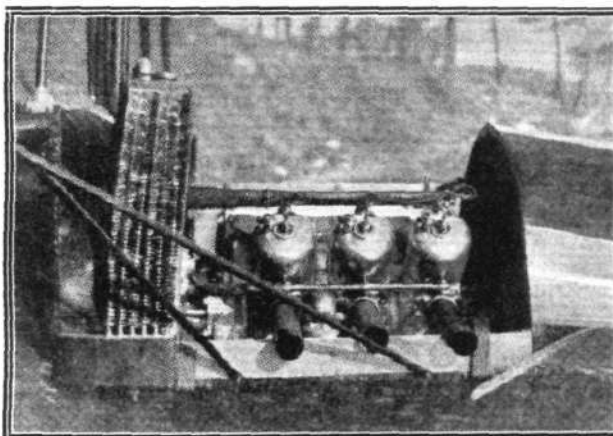


Fig 1.—The 6-cylinder Johnson two-stroke motor mounted in the Shaw flying boat.

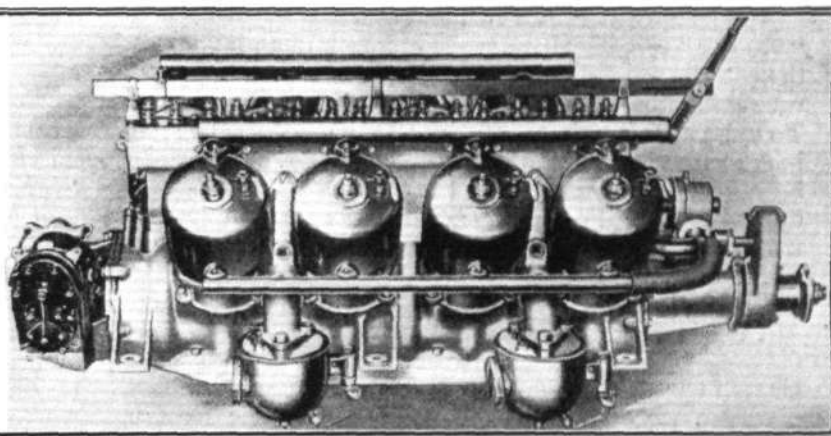


Fig. 2.—The 8-cylinder Johnson two-stroke aero-motor.

the regulation at variable loads and speeds, or the flexibility of the engine, and in the Johnson an original method of overcoming this is employed. A series of poppet valves are interposed between the carburettors and the crank chambers of the cylinders which may be opened or closed, two at a time, so that the number of cylinders receiving a mixture of fuel, and therefore the power, is regulated by means of a hand operated control lever. Thus, those cylinders which are not cut out receive their full charge of mixture. It is claimed that this arrangement works quite satisfactorily and the engine is exceptionally flexible.

The separate cylinders are of cast iron with cast aluminium jackets pressed on, and each cylinder is held down on to the crankcase by four bolts passing through a flange formed in the base of the cylinder. The pistons are made of magnalium with ribs formed inside, which present a large cooling surface to the mixture as it passes from the crankcase to the cylinder, and thus assists in keeping the piston cool. In other respects the piston and cylinder follow the usual practice of two-stroke motors, the mixture passing from the crankcase to the cylinder through a port in the side of the piston, which is uncovered at the bottom of each stroke. The sparking

throughout the test was 1,200 r.p.m., and 120 gallons of petrol and 15 gallons of oil were consumed. About 95 horse-power was developed, and the engine ran uniformly throughout the test. At the end of the ten hours the engine was stopped—the magneto was short-circuited and the engine came to rest without any sign of back-kick—and examined. The bearings and cylinders were quite cool and showed no signs of wear; the pistons likewise were in good condition and free from carbon deposit, and other moving parts showed little signs of wear, thus indicating that the lubricating system was satisfactory. The weight of the engine without the radiator or water comes out at about 403 lbs., making the weight per horse power about 4.25 lbs. The fuel consumption is .75 lbs. per horse power, which compares very favourably with other two-stroke motors. The weights of the other models, without radiator and water, are 4-cylinder 208 lbs., six-cylinder 298 lbs. and twelve-cylinder 595 lbs. One of the six-cylinder models has given quite good results fitted in the Shaw flying-boat, a view of this engine in position being shown in fig. 1. Fig. 2 shows the eight-cylinder model, in which the lever operating the poppet valves controlling the supply of mixture for the cylinders may be seen.

SAGE'S ENTERPRISE AT PETERBOROUGH.

"SPECIALISTS in wood and metal." It was a far-seeing mind which many years ago had the happy inspiration to adopt that legend to indicate to all whom it may concern the nature of the business of what has since become one of the best-known firms in the commercial world. This firm was Messrs. Frederick Sage and Co., of London, and the adoption of the phrase shewed that those who were responsible for shaping the beginnings of the business, realised that it offered boundless possibilities, and therefore left it open for their successors to take full advantage of any opportunity which might arise.

One benefit which has accrued from this early ideal is that they have been able with a clear conscience to enter the aeronautical world. With the prolongation of the war came a natural slump in shop-fitting. The firm had hosts of workmen who had been with them for many years, some of them from boyhood, and in thinking of themselves they thought also of their men in the selection of some means of turning their wonderful skill to account in a manner leading to their mutual benefit.

"Specialists in wood and metal." It seems to drift by a natural course into aircraft construction, for into what channel could such valuable experience be turned to better account?

And so aircraft it became, and it was with pleasure a "FLIGHT" representative availed himself of an invitation to visit the works the other day, to see personally the wonderful things that had happened, and were happening. To write of this visit, to attempt to convey to readers the impression obtained in this hive of industry, and yet not be accused of over-stating the position, is somewhat difficult. Here, however, is a brief history of the development, how it was brought about, and what has happened since.

In June, Mr. G. A. Coulson, general manager, and Mr. David Hawes, his enterprising *confrère*, met in conference, and by the first week in July had obtained Government orders for aircraft. Mr. Littlewood, works manager, with Mr. N. A. Feary as responsible for the purchasing of all material, and Mr. A. Leeper controlling the production of metal parts and erection of the machines, set to work, and in almost less time than it takes to tell, the first machine was on the stocks, although it was not so easily brought to that stage of fruition as it might seem. The order secured, there came the first difficulty; working drawings could not be obtained in time to satisfy these go-ahead men. That difficulty was soon overcome—they went down to the "source of origin," and made their own drawings from machines already in being, and so exact were these that they are being worked from even now.

It does not seem possible that a collection of workers on shop fittings, clever as they might be, could, almost without expert aid, adapt themselves to aircraft construction, yet the quality of the work seen during our visit was of the highest possible. Better could not be produced in any aeronautical works in the country.

Four-bladed laminated propellers are a rather stiff proposition to be undertaken by a shop-fittings carver, yet there at the works this is being carried through with such success that in addition to their own requirements the firm are already engaged in executing orders for outside businesses, and the Government's own inspector has pronounced the finished article as ranking with the best he has seen.

It would appear as if, with a firm like Sage and Co., Government inspectors should be superfluous. But just

the same they are an official necessity, although there are inspectors *and* inspectors. Those whose work happens to fall in the Sage factory are men thoroughly versed in the requirements of the Services, and see that they are filled to the smallest item. But in this case their task must be easy. The remarkable thing is that under such circumstances they can maintain the keen watchfulness which they do, to ensure the impossibility of anything in the smallest degree outside specification getting through.

Right royally did the men work, but hardly were they under way before along came another large order for aircraft of an entirely different type, and it was deemed necessary to separate the organisation into two sections, and to find for the new one a capable organiser and manager to co-operate with Mr. Hawes. Mr. E. C. Gordon England—a man of sound practical experience—was chosen for the position. No better choice could have been made. Entering aviation in 1909, Mr. England has had almost unique experiences both in piloting and construction, whilst his extensive knowledge and experience were just the things necessary to ensure the new enterprise being launched on a thoroughly sound basis.

The result of the banding together of all that could make for success was evident to the eye, on our visit to the works in the first week of October, scarcely four months after the decision to enter upon the work. There we found more than a baker's dozen of machines on the stocks, several of them almost ready for delivery, and this in addition to some already delivered. Nor does this represent the output of the re-organised factory, for with all the pressure entailed by the work in their own aircraft, they have yet been able to supply parts to others, and, in addition, to manufacture many thousands of heavy boxes required for another Government office. When it is considered that the old workshops had to be practically gutted, and most of the old machinery replaced by new in keeping with the requirements of the entirely new work, and that in addition a new shop 250 ft. long by 65 ft. wide and 25 ft. to the beams had to be erected, some idea of the hustle necessitated can be imagined.

The factory is ideally situated in the country, and no pains have been spared, not only to equip it with the most up-to-date machinery of every sort, but also to ensure the comfort and health of the employees working therein. The new shop will shortly be electrically lighted from energy derived from a private power plant now in course of erection, and the ventilation is upon the most modern approved plan. The shops are exceptionally clean and bright. Every bench giving off sawdust or shavings is connected by vacuum tube to an overhead main pipe, through which every atom of dust is sucked up, and borne away to be automatically converted into gas, the resultant being utilised to drive a 250 h.p. gas engine, which returns its power in the form of drive to the overhead shafting. Large grounds adjoining are already earmarked for the erection of new shops, and the entry of the firm into the industry, not only for war needs but as a permanent branch of their undertaking, marks a further step in the advance of aviation.

A very large skilled body of men for this special work has been brought together in a remarkably short time, but owing to the extraordinarily rapid expansion which has taken place, the cry is still for more men for every department, as it is the company's ambition that their works shall rank as one of the largest and most up-to-date Aircraft Factories in Great Britain.

ARMCHAIR REFLECTIONS

by the "Dreamer"



MR. HUDSON MAXIM is, I feel sure, a personage of great and profound learning, because according to my daily news provider he has been appointed "the high explosive and aeronautical expert on the recently appointed United States Naval Advisory Board," and no man could hold such an appointment on such a board without being an expert and learned. Yet when he is reported to have said that "The aeroplane is a species of scarecrow," and that "Count Zeppelin is a sort of bogey man," and "pooh, pooh" to the Zeppelins over London, being left with, it seems to me, only balloons to advise upon favourably in the aeronautical department of his appointment, I begin to wonder whether the reporter has been able to decipher his shorthand notes correctly.

It may be, of course, that the U.S.N.A. expert has advanced ideas in aeronautics, and does not believe in the future of either aeroplanes, or gas-bags of the Zeppelin variety, but if the report be correct, he appears to see possibilities for the balloon which I can hardly endorse—in fact, I could scarcely even imagine them in my most optimistic dreaming mood.

He is credited with having made the statement that if he were a Londoner with Government backing, he would fight Zeppelins with balloons. He would, it is said, have a circle of balloons all round London. Each balloon would carry a machine gun and a crew of three men. On the top he would have a platform carrying an aeroplane, which could be launched when at the proper altitude, and at the vital moment. Each balloon would be connected by telephone with all the other balloons, and with the earth. They would not be kept in the air, but sent up when it became necessary to ward off attacks.

It seems to me, looking at it from an unbiassed point of view, that these are going to be "some" balloons. The weight of three men, and a machine gun with ammunition, in a basket large enough to give elbow room, plus telephone instruments and the weight of wire from balloon to balloon and to the earth, would amount to a good few pounds. Coming to the aeroplane this might easily account for fifteen hundred pounds or so, with fuel. Then, as presumably Mr. Maxim's "military aeroplane" would be also armed, there is the aeroplane's quick-firer, and with its ammunition, the aeroplane platform, the pilot, the mechanic, and in addition, I suppose, a couple of miles of 35 cwt. cable with which to anchor the whole contraption to the ground. Honestly, I don't quite see it, from many points of view, or even from any point of view.

I should not care to be one of those whose duty it was to look after the sand-bags hung round the netting when the balloon was in course of inflation. I cannot see myself dodging round a half-inflated balloon with a platform and an aeroplane on the top, in a small breeze—I am afraid moral support would not fill the bill. I cannot gather from the report whether the platform would be large enough to allow of a short run when the machine was getting away, or whether the mechanic would just start the engine up and let the whole thing fall overboard. In the latter case, he is going to have the time of his life

in getting clear and hanging on by his teeth whilst the platform does a gentle war-dance on its own. Unless the platform were fairly big also, I can imagine danger of the wheels dropping on to the side of the balloon, or even the tail skid taking a portion of fabric with it as a memento and bringing about family troubles in the other balloons, joined together as they are by telephone wires. Incidentally I can see some of the other aeroplanes doing a bit of stunting on their own by prematurely looping-the-loop minus pilot. I like the words "of course." They settle all captious doubtings. Mr. Maxim is reported to have said "Of course the altitude of the Zeppelins would be determined first and the balloons would be immediately raised to that height so that the aeroplanes would not have to climb far when starting for the attack." I am in no position to say how long it would take a balloon with this weight on board to reach 10,000 ft., but I can imagine it a really grand sight to see dozens of them starting away simultaneously from the ground, each with its aeroplane on top, the whole circuit joined together by a common bond in the shape of wires. I should not care to be anywhere underneath this little display, but if it is ever to be tried, which heaven forbid, I should not mind being up in the Zep. when the aeroplane launching business came about, because I can quite foresee an aerial gymnastic display of quite a spectacular order, if some of the engines jib at the job and refuse to start up. A few of the balloons relieved of their weight would bound up, and cause some temporary embarrassment to those mechanics on the others engaged in the gentle art of prop swinging. It would be a time for quick thought and action; whether to hang on to the revolving prop, fall down and cuddle the undercarriage, or write to *John Bull* about it.

It may be, of course, that Mr. Maxim has been enjoying himself in the gentle art of leg-pulling—he has a reputation that way—at the expense of the reporter, never thinking that he would be taken seriously. It is really surprising the extent of gullibility of the lay press in matters of which they know little themselves, and therefore seem all the more eager to inform their readers thereon.

Gentle reader, if you are not a great man never try to become one. I do not speak from personal experience, but I believe the way of the expert is hard, reporters are but human, word spinning is necessary to their livelihood, and the public is unsympathetic.

It is futile to go around with a sixshooter in your hip pocket looking for a reporter after the paper has once gone to press, and it may eventuate into a nasty accident.

If ever I *am* a great man, and hold a position carrying with it a title only half the length of that of Mr. Hudson Maxim, I shall take care to lay low and say nothing. Draw the supertax screw and keep my mouth shut, shall be my motto, and if any reporters come buzzing around me I intend to hide in the cellar till they have cleared. You never know what these busy-bodies will make you say, except words which you won't want to write home and expatiate upon to your revered maternal parent.

AIRCRAFT AND THE WAR.

THE following details of a raid on Zeebrugge by British aviators were obtained by the *Tyd* from the Belgian frontier:—

"On Saturday night five English aviators left Dunkirk and reached Zeebrugge at six o'clock yesterday morning, dropping a number of bombs on points of military importance. German anti-aircraft guns shelled them heavily. One of the machines, driven by a naval officer named Boyd, had just dropped the last bomb when the aeroplane, the altitude indicator of which marked 14,000 ft., was hit by shrapnel in the motor. The machine began to fall, but the aviator succeeded in keeping himself for some time in the air and then made for Dutch territory, which he reached in a volplane and landed at Nieuwvliet (Zeeland). The aeroplane was hit in five places. The aviator, who said that presumably another aeroplane was shot down, will be interned."

The *Morning Post* correspondent at Amsterdam, writing on October 5th, said:—

"After the bombardment of the Belgian coast yesterday morning five airmen of the Allies made an attack on Zeebrugge harbour, on which several large bombs were dropped, apparently with good results. The Germans opened violent fire with anti-aircraft guns."

Reuter's correspondent at Petrograd, writing on October 5th, said:—

"Several Taubes have been brought down in the Russian lines."

A Central News correspondent at Amsterdam on Tuesday, reported:—

"A German war correspondent gives the following account of the raid by Allied airmen upon Vouziers:

"About half-past four in the afternoon of October 3rd," he says, "some twenty French airmen approached Vouziers and began a concerted attack on the town. Three of the aeroplanes advanced first in a group flying at a great altitude, and as soon as they were right over the middle of the place a heavy bombardment was begun. German airmen promptly ascended, and it was a wonderful sight to watch how the aeroplanes circled around one another, each trying to bring the enemy down with machine-gun fire. Our anti-aircraft guns also entered the fight, but none of the French airmen could be brought down. Suddenly the entire squadron turned about and disappeared amid the clouds."

"The correspondent says that practically no damage was caused, but in view of the admitted fact that a large number of incendiary and explosive bombs were dropped this seems, to say the least of it, very improbable. It is declared that four civilians and some horses were killed by the bombs."

According to information received in Amsterdam on the 5th inst., the Grand Ducal Government has sent a protest to the Entente Governments with regard to the recent aerial attack on Luxemburg. The Luxemburg papers state that sixteen bombs were dropped at Luxemburg during the recent air raid. The damage to private property was not very considerable, but several persons were injured. One bomb exploded near a benzine dépôt, but caused no damage.

The *Telegraaf* on the 5th inst. reported:—

"The recent bombardment of Zeebrugge by monitors, together with six aeroplanes, slightly damaged Solway's factory. The bombardment was less successful than the previous one, and the response from the German batteries was not so heavy."

The *Daily Telegraph* correspondent in Paris, writing on October 8th, stated:—

"A French aviator from Dunkirk who, with an observer, was captured by the enemy on December 6th, gives from an internment camp in Germany a remarkable account of his capture in a telegraphic style which I translate literally.

"December 6th, nine a.m.—Leave Dunkirk to reconnoitre Ghent by Ypres, Menin, and Courtrai. Ypres in forty-five minutes. A hundred or 200 yards round us a white puff of smoke. Only seventy-seven. No danger. Soon, however, a bluish puff of smoke, much more unpleasant. Over Menin frightfully shaken about by the bombardment. Over Audenarde more violently shaken still. Have to do wild acrobatics in the air. Pass through stifling smoke, which gets into one's throat.

"Suddenly over Ghent the motor misfires, evidently heating. Look round, see enormous jet of steam from cylinder, evidently hit by shrapnel. Turn right round, try for Ypres, plane down almost

vertically 2,000 yards. Shells all round us, almost blinded. A thousand yards; steering gear out, then great piece of canvas from plane torn off. Now bullets as well as shells. See garden below. Dash down into it unhurt, but biplane damaged. Germans round us a few hundred yards off. They will take us, but shall not have our machine. Made up our minds to be killed rather than leave our Voisin in their hands, but can find no matches. Rush Flemish farm 100 yards off, snatch box of matches from mantelpiece and back to aeroplane, but impossible to set fire to tank. Try to set light to our maps, but they won't burn. Enemy now shooting at us. Try to bore hole in tank. German bullet does the work.

"Then have inspiration and fire off rifle into tank. Petrol pours out and is easily set fire to 130 litres. Burn machine to ashes. During the conflagration, lasting over ten minutes, Germans held aloof, but potted at us. Wounded in left hand, but they did not get our aeroplane."

Writing from Nish on October 4th, the *Daily Telegraph* correspondent said:—

"Enemy aeroplanes during the last few days have thrown bombs over Kraguevatz, Yagodina, and Pozharevatz. This afternoon they appeared for the first time over Nish. If they came from the east they must have come from Bulgaria, but it is difficult to say whether it was an Austrian or Bulgarian aviator. He threw bombs and killed three Austrian war prisoners, one girl and one child. No material damage was done."

The *Telegraaf* has published the following details of a raid on Lichtervelde and Khortemarck, made on October 2nd, by an Allied aviator:—

"For some time the aviator cruised above the district, evidently seeking his object of attack. Later a loud explosion was heard, and it is supposed that he destroyed the German petrol magazine.

"On the occasion of the air raid on Lichtervelde a few weeks ago, it is now learned, thirty-two German soldiers were killed."

Information was received in Amsterdam on Saturday from the Austro-Serbian frontier to the effect that two trains with aeroplanes and eight long trains with big guns have arrived at Orsova.

A telegram from Nish to the *Corriere della Sera* on Saturday stated.

"A German aeroplane flew over Nish and dropped bombs, which fell on the Austrian prisoners' concentration camp, killing two Austrians and injuring several others."

The following details of recent raids on Ghent and Gontrade have appeared in the *Echo Belge*:—

"The air squadron appeared over the district in the afternoon of October 8th and made direct for the hangars in the German aviation ground, upon which they rained bombs until not one of the hangars was left standing. All the sheds with their contents were burned out. About ten houses were set on fire. The Germans opened a heavy bombardment against the aviators, but without success, much to the satisfaction of the inhabitants of Ghent, who followed the raid with tense interest, not unmixed naturally with a certain amount of anxiety for their own safety.

"Several Allied aviators again appeared over the town on Sunday about half-past five in the afternoon, apparently engaged in pursuing an enemy airman. On Monday, between eight and nine o'clock in the evening, one of the Allies' aviators was seen flying over Eastern Flanders and Ghent in the direction of Ostend."

According to a Central News message from Amsterdam four British aeroplanes made the attack on Sunday afternoon in a heavy fog. They were subjected to a vigorous bombardment by the anti-aircraft guns.

Information received in Amsterdam from Berlin on Tuesday was to the effect that a German waterplane while making reconnoitring flights on October 10th dropped ten bombs on the railway station at Riga. The waterplane is stated to have returned safely to its base.

Writing home from the front, one of our readers gives the following first-hand description of a fight in the air:—

"We had a fine aerial drama over us this morning. A Taube came almost overhead, and our anti-aircraft guns opened fire on her. We watched the shells bursting around her, and one very well aimed seemed to hit her, but evidently it must have been just below; another went very close, drawing a chorus of 'Ohs' from us who

were watching. Evidently finding it too warm she turned sharply and cleverly, and made back for safety, but the thrilling part of the drama was yet to come, for with her machine-gun spitting viciously one of our aeroplanes came streaking through a cloud, apparently taking the Boche by surprise, and went for her like a thunderbolt. There were some moments of breathless excitement as the two machines manœuvred round one another, their machine guns rattling away. Then the Boches turned to make an escape, but too late, for one shot hit the petrol tank, causing a long, white cloud of smoke to film out across the sky. The leaden stream caught the pilot taking off the top of his head.

"The machine then dipped suddenly, righted herself for a second or two, dipped again and then turned a somersault, flinging two of the three occupants out, and then the Taube came crashing to earth and smashed to bits. Heartfelt cheers rent the air. Hurrying to the spot we came upon an unpleasant sight. One of the airmen lived for a few minutes, the other two were mangled beyond all recognition or description. One had an Iron Cross of the First Order on his breast. They say it was for raiding London; if so, he will raid no more. The whole affair was over in less time than it takes to tell it, but it was exciting.

"Our aircraft are doing splendid work out here, and only since I have been out have I realised that in the future there is no doubt as to who will have supremacy in the air as well as the command of the sea."



London's Terror of the Zeppelins.

THERE is a story going the rounds about an early morning visit by the Prime Minister through the London districts damaged by the Zeppelins. He came in a big motor car, and officials permitted him to pass the fire lines everywhere. When he came upon an old woman, proprietress of a public-house which had been pretty well knocked about by bombs, he found a tartar of no mean order. "And how have you fared?" asked Mr. Asquith.

"G'wan with you," retorted the woman. "Look out for yourself, and don't ask silly questions."

THEY tell a funny story about Jack Johnson, who was appearing in a revue at one of the suburban music halls. Asked by the management to make some quieting announcement to the audience, the once world's champion appeared before the curtain and said:—

"There ain't no use trying to lie to you all. Right now thar is one of them Zeppelins over this here theayter, but it won't do no good to get scared, and you might better take a chance and stay here than go outside and ask for trouble."

The strange part is that the audience agreed with him—and stayed.

SIR GEORGE ALEXANDER, playing in his new play at St. James's Theatre, also addressed a capacity audience and begged them to remain in their seats, although the sound of exploding shrapnel from anti-aircraft guns was plainly audible in the theatre. Here, as elsewhere all over London, there was not the slightest sign of panic, and the actors continued to finish the play through the thundering of artillery.—*Mr. W. O. Tewson in the New York American.*

A Clever Husband.

"So your wife has stopped bothering you for an aerobus?"

"Yes; I tipped off a palmist she patronises to warn her against ever riding in one."—*Aerial Age.*

LANDLADY (hammering with poker on lodger's bedroom door, 2 a.m.): "'Ere's the Zeppelins, sir!"

LODGER (from deep down in the pillows): "Right-O! Put 'em down outside."—*Punch.*

In 1950.

AN officer was showing an old lady over the monster war-plane. "This," said he, pointing to an inscribed plate on the deck, "is where our gallant captain fell."

"No wonder," replied the old lady. "I nearly slipped on it myself."—*American Exchange.*

A French military correspondent, writing in the *Morning Post* of the 14th, regarding the recent fighting in the Champagne district, said:—

"The preparation for a modern battle consists in a large and varied number of devices. One of the most useful is the reconnoitring of the enemy's positions by means of aircraft. In Champagne the French aviators accomplished their mission in admirable fashion. They provided the General Staff not only with detailed descriptions, but with minute photographs of all the enemy's system of trenches and defensive works. This done, the work of destruction by the artillery began."

In a message dealing with the bringing down of the French dirigible "Alsace," the *Kölnische Zeitung* said:—

"Three members of the crew first sprang from the sinking vessel; one of these came to grief, while the other two were taken prisoners. The other five men sprang out later. The abandoned airship drifted on to a wood near Tagnon, between Reims and Rethel, where it became entangled in the trees."

The *Frankfurter Zeitung* expresses relief at the fact that the Champagne Army has been delivered from the persistent attentions of this "ghostly nuisance."



AFTER THE ZEPPELIN BOMB EXPLOSION.—
Optimist: "Hooray! there goes a bit of Aunt Matilda's vase; it has always bothered me to know how to get rid of the beastly thing without giving offence."—*London Opinion.*

Not an Aeroplane.

A MISSISSIPPI RIVER steamer was stopped in the mouth of a tributary stream owing to a fog. An old lady passenger inquired of the captain the cause of the delay.

"Can't see up the river," was the laconic response.

"But I can see the stars overhead," said the old lady.

"Yes, ma'am," continued the captain; "but until the boilers bust we ain't going that way."—*Aerial Age*.

When a "Jay" is Christian.

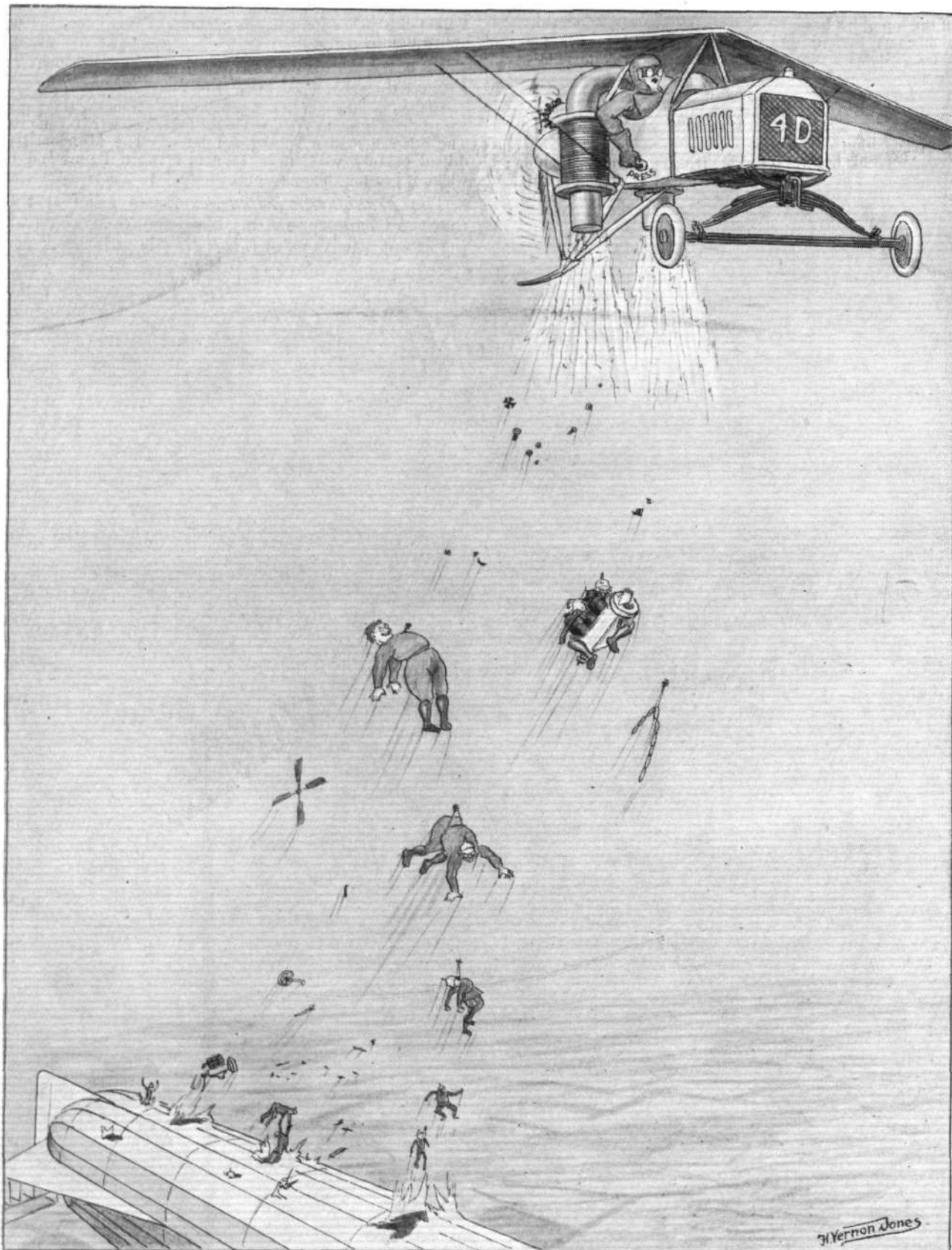
"WHAT is your full name?" said counsel to a witness at Westminster County Court this week.

THE WITNESS: "Jay Chapman."

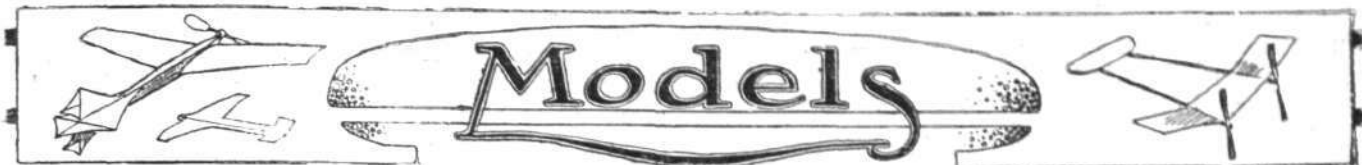
"What is 'J' for?"—"Jay."

"Yes, but what?"—"J-A-Y."

"Oh! I see," said counsel, spelling it. "J-A-Y Jay."



ZEP. "STRAFING" DEVICES. By "FLIGHT'S" Tame Inventor.
No. 5.—The Electro-Magnetic "Old Iron" Extractor.



ALL communications in connection with this section should be addressed to the Model Editor, "FLIGHT," 44, St. Martin's Lane, London, W.C. Correspondents are requested to write on one side of the paper only.

Lighter-than-Air Models.

IN view of the attention which has been attracted to the lighter-than-air type of aircraft, not only by Zeppelin, but also other airships of various sizes and types, it may not be out of place to draw attention to the fact that it is quite possible to make satisfactory models of such craft. As there seems to be no doubt that for military purposes there will always be a distinct scope for airship work it may also be that experimenting in such a direction may not be altogether without profit. Apart from the military aspect, there are many who hold to the opinion that when peace does come again, airships of the smaller types will almost, if not entirely, take the place of the spherical balloon. It can be readily seen that a small airship offers considerably more opportunities for sport than the balloon, as it will be possible to make journeys from point to point instead of having to depend upon the fickleness of the wind. It must not be overlooked that among the many things which are being learnt in the war is much that pertains to airships of various sizes, and that knowledge will be to a large extent available for more peaceful use when the war is over.

However that may be, there is plenty of scope for the aeromodellist who, having become tired of playing with "flying sticks" or scale models of full-sized machines, wishes for new fields to conquer. He will find that although it will perhaps not be quite so simple as some of his work in the past, it will be exceedingly interesting, and the overcoming of the various obstacles will but add zest to his labours.

The subject is one which has not been altogether neglected, and Mr. V. E. Johnson, in his book "Modern Models," which is published at one shilling by Messrs. C. Arthur Pearson, devotes a chapter to the designing and construction of such a model, and those who contemplate taking up the matter would find it profitable to study Mr. Johnson's suggestions.

The first thing considered will be the size of the envelope necessary to carry the required motor power, but anyway it will be found inadvisable to experiment with anything less than 12 in. by 2 in., which will give a capacity of 35.63 cubic feet. Using commercial hydrogen, this should give a lift of 34.24 ozs., and Mr. Johnson calculates that the envelope made of goldbeater's skin would weigh 8.36 ozs., so that the net lift would be 25.88 ozs., a little over a pound and a half.

Another primary consideration will be the shape of the gasbag, and this appears to offer plenty of latitude for experimentalists to employ their ingenuity. The design must be such that the envelope can be driven through the air with the minimum amount of resistance.

The devising of ways and means of getting the most power with the minimum of weight also opens up a wide field, and then there will be the question of how and where to suspend the power plant, together with the propeller or propellers.

As to the material for making the envelope, Mr. Johnson states that for small models, as mentioned above, it is only practicable to use goldbeater's skin, which is very thin and tough. It weighs 0.1 oz. per square foot, but cannot be obtained in larger pieces than about 24 ins. by 14 ins.

The car of the model dirigible will be very much on the same lines as the fuselage of a model aeroplane, and, of course, the propellers will be similar, although larger, and driven by rubber motors. It will be found most advantageous to arrange one propeller, or rather tractor, at the front and one at the rear, and they should be of such a pitch as to turn at about 500 revolutions a minute. The car must be suspended with the guy threads or strings arranged in a triangular system in order that the strain may be properly distributed.

The model is steered in a horizontal direction by means of rudders and it will probably be found most advantageous to arrange one behind the front screw and the other just in front of the rear one. The framework of the rudders may consist of steel wire and the coverings of goldbeater's skin or light proofed silk. Elevators can be fitted, but Mr. Johnson states that for elevation horizontally revolving propellers are the best. In making rudders and elevators and also the rest of the model it is essential to remember that everything should be made as smooth as possible in order to reduce skin friction to a minimum.

Presuming that it is intended to use hydrogen for inflating the airships, it is not advisable to attempt to make one's own gas. It will be found much better to obtain it compressed in a steel cylinder.

One most important point to remember, however, is that hydrogen and air form an explosive mixture, and so extreme care should be taken to see that no naked lights are about when the envelope is being inflated. Coal gas could be used, but its lifting power is only about half that of hydrogen, and it would be necessary to have a force pump to get it into the envelope.

Power-Driven Paper Models.

MR. H. MAJOR writes as follows:—

"I read with some amusement of the evident surprise shown by your correspondent, Mr. C. B. Cook, in his discovery that small power-driven models are capable of emulating the feats generally associated with 'full-size' machines. Small paper aeroplanes, complete with rubber motor, 5-in. carved propeller, &c., turning the scale at a quarter of an ounce, are able to travel with perfect stability and certainty distances up to 200 ft. in a straight line.

"During the past three and a half years I have constructed well over one hundred of these small scale models, meeting with such success that, upon occasion, I have been surprised myself by the performances of a new type. Indeed, I have no hesitation in saying that far more may be learned by an amateur of the essential conditions of flight by the use of these models than by the construction of a limited number of larger machines, the analysis of which is necessarily more complicated. An exhaustive study of the whole principles of aerostatics may be undertaken with the practical certainty of the deductions made being accurate in a high degree.

"There is no type of aeroplane existing of which it is impossible to make a small scale model with success. Tractor biplanes, propeller biplanes, with the screw revolving within the compass of the outrigger, and even scale copies of the old type Maurice Farman (here the tail booms are set farther apart so as to allow the use of a larger propeller), may be built to cover distances in proportion to the speed and design.

"Naturally an amount of time must be spent in perfecting details and adding refinements. For instance, it took me three months to design a really efficient propeller bearing, but then that bearing was standardised, and I have used no other pattern for three years. Also, a piece of folded paper is not an efficient, or even a strong, substitute for cross-braced interplane struts, and the use of such would radically affect the design of any model. It must be emphasised, however, that the greatest care must be taken in designing the model.

"The propeller, as an example, should be carefully carved so as to comply with the laws appertaining thereto. Do not when making a high-speed model fit it with swept-back wings under the impression that you are decreasing head resistance. This only serves to slow the aeroplane. It would be interesting to hear some correspondent's views upon this subject. The following few notes may be of assistance:—

"In designing the first model choose a tractor monoplane.

"See that the wings have a good upward dihedral angle.

"Fit a screw of ample size. (Nearly half the span is desirable. I have no doubt that Mr. Cook would obtain a greatly increased flight if he fitted a propeller half an inch longer with wider blades.)

"See that you allow sufficient stabilising surface in the rear.

"The tail should be placed the greatest distance possible in the rear of the wings, and in most cases set at a slight negative angle.

"Do not use cardboard or drawing paper anywhere in the construction of the model. A hard bank paper is best with a smooth surface. Substance about 18 to 20 lbs. demy.

"Make use of an adequate camber in the planes. A good all-round form is the following:—Strike an arc two-thirds of the length of the required chord, and complete the line at a tangent. Vary the radius of the arc in proportion to the camber required.

"Construct the wings scientifically. One form is to use one thickness of paper, overlapping the leading and trailing edges, and then glue these down over two very thin cane spars.

"Do not use gum or paste of any description. An adhesive such as seccotine is the most satisfactory.

"I may mention in conclusion that it is not unusual for these miniature aeroplanes to attain a height of 20 to 30 feet, and special looping models may be constructed with success."

[We hope Mr. Major will send on further particulars regarding his models and details of the fittings mentioned, as they would doubtless be of assistance to other readers.—ED.]

METAL FITTINGS FOR AEROPLANES.

ONE of the greatest problems the manufacturer of aeroplanes has had to contend with has been the supply of metal fittings. In the first place, the firms manufacturing these all-important components were comparatively few in number, and demand exceeded supply, and secondly, the majority of fittings required, especially those relating to the B.E. species, were of a somewhat complicated nature, and no small amount of trouble was experienced in their manufacture. Of late, however, matters have brightened up, several new firms having taken up the production of these fittings. One of these is Messrs. Kroll and Co., of Bayham Place, Camden Town, London, N.W., a firm very well known in the automobile world in connection with sheet metal work, &c. It was only last year they started, in a comparatively small way, an aviation branch, and their early efforts convinced them that there was room for considerable improvement over existing methods of manufacturing these fittings, *i.e.*, by substituting, as far as possible, machinery for hand work. Their previous extensive experience in metal work enabled them to do this with highly satisfactory results, ensuring large and speedy production with the greatest possible degree of accuracy. They are now in a position to undertake any kind of metal work connected with aircraft as well as other classes of work—they are, in fact, already engaged upon a large amount of munition work. Not only are their works at Bayham Place well equipped with tools and machinery, but there is ample space for future developments.

The late Lieutenant Warneford.

THE following letter from the King has been received by Mrs. Corkery, the mother of the late Lieutenant Warneford, V.C. :—
"It is a matter of sincere regret to me that the death of Flight Sub-Lieutenant Reginald Alexander John Warneford deprived me of the pride of personally conferring upon him the Victoria Cross, the greatest of all naval distinctions." "GEORGE, R.I."

The Supremacy of the Air.

THE communiqué issued from Berlin by wireless on the 6th inst., regarding the ascendancy of the air, together with the French reply to the German claims will be found *in extenso* in the leader on p. 775, so that it is unnecessary to reproduce them in full here.

A Relic of the Raid.

AT the last meeting of the Metropolitan Public Gardens Association a letter was read from the Trustees of the London Museum asking that the broken fragments of the drinking fountain, a solid granite structure occupying the centre of a space in London which had been shattered by the explosion of a Zeppelin bomb, should be preserved in the Museum, and it was agreed to commend the proposal to the authorities in whose care the fountain had been placed.

Double Fatality in Paris.

WHILE flying near the Eiffel Tower in Paris on Monday, a biplane, piloted by Lieut. Fourcade, was compelled to come down owing to engine trouble. The pilot endeavoured to land in the Boulevard Delessart, in the Trocadero gardens, but the machine was smashed and pilot and passenger—Sergeant Clery—so seriously injured that they died soon after being taken to hospital.

A Zeppelin at Sofia.

A MESSAGE from the Salonika correspondent of the *Messaggero* on Tuesday stated that the officers in charge of the Zeppelin which arrived in Bulgaria after passing over Serbia visited King Ferdinand, who gave a special banquet in their honour. The King enthusiastically toasted the Kaiser, and at the conclusion of the toast broke his glass to give added solemnity to the occasion.

A Fire at Johannisthal.

INFORMATION was received in Amsterdam on Tuesday that a serious fire occurred at the Johannisthal Aerodrome, near Berlin, during the night of October 9-10. The old aeroplane shed was destroyed, and several aeroplanes were burned.

A Fatal Accident in Germany.

ACCORDING to a report which reached Amsterdam on the 6th inst., Count Koenigsmarck, while making a trial flight with an aeroplane from Hanover to Brunsbittel, near Bergedorf, fell from a considerable altitude, and was so severely injured that he died shortly afterwards.

For Bronze Castings.

THE attention of those who use bronze castings may be drawn to the fact that the Yorkshire Engineering Supplies, Ltd., of Hunslet Road, Leeds, specialise entirely in the highest grade of phosphor bronze bearings for aero engines and other special purposes. This firm is engaged extensively on the manufacture of what is known as Y.E.S. Aero Bronze cast by the Patent Eaton process for use on R.A.F. engines for Government service.

In Praise of Oleo Plugs.

"As others see us" is a booklet which has just been issued by Messrs. Leo Ripault and Co., containing letters from men giving their satisfactory experiences with Oleo plugs in various parts of the world. Added interest is given to the pages by a splendid signed portrait of Pegoud, who was a satisfied user of Oleo plugs. Any of our readers wishing for a copy should write to Messrs. Leo Ripault and Co., 64a, Poland Street, London, W.

A Precaution at Newcastle.

As a precaution against air raids the Lord Mayor of Newcastle has requested that church bells and public clocks be silenced between sunset and sunrise.

A Flying School for Winnipeg.

ACTIVE steps are being taken to establish a flying school at Winnipeg, and Col. Hamilton Merritt of Toronto has promised to give £2,000 towards the cost, while the Hon. Thomas Johnson has stated that the Manitoba Government will contribute a similar amount, in addition to the aeroplane and pilot which the colony is providing for the Imperial forces. It was originally intended to install both aeroplanes and waterplanes at the school, but in order to keep the cost down to £8,000 it has been decided to confine activities to the land machines.

IMPORTS AND EXPORTS, 1914-1915.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see "FLIGHT" for January 25th, 1912; for 1912 and 1913, see "FLIGHT" for January 17th, 1914; and for 1914, see "FLIGHT" for January 15th, 1915:—

	Imports.		Exports.		Re-Exportation.	
	1914.	1915.	1914.	1915.	1914.	1915.
January ...	5,945	20,382	210	435	879	13,706
February ...	28,132	380	106	138	441	18,823
March ...	27,731	280	1,934	7,218	1,440	5,090
April ...	11,384	2,189	1,175	23,986	1,473	275
May ...	17,062	178	4,059	12,530	9,484	8,250
June ...	15,967	5,469	5,082	3,730	142	2,400
July ...	15,548	1,240	4,994	13,372	1,695	—
August ...	52,448	664	630	36,276	910	247
September ...	4,859	536	—	4,908	—	—
	179,076	31,318	18,190	102,593	16,464	48,791

Aeronautical Patents Published.

Applied for in 1914.

Published October 14th, 1915.

24,021. F. B. DEROCLE. Storing projectiles on, and discharging them from, aerial apparatus.

Applied for in 1915.

Published October 14th, 1915.

3,203. H. O. SHORT. Aeroplanes.
9,488. G. MADEIRA. Stabilisers for aerial machines.

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